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**Bibliography**

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(19) [Country of Issue] Japan Patent Office (JP)

(12) [Official Gazette Type] Open patent official report (A)

(11) [Publication No.] JP,2002-210124,A (P2002-210124A)

(43) [Date of Publication] July 30, Heisei 14 (2002. 7.30)

(54) [Title of the Invention] Game machine

(51) [The 7th edition of International Patent Classification]

A63F 7/02 320

[FI]

A63F 7/02 320

[Request for Examination] Un-asking.

[The number of claims] 9

[Mode of Application] OL

[Number of Pages] 34

(21) [Filing Number] Application for patent 2001-8334 (P2001-8334)

(22) [Filing Date] January 16, Heisei 13 (2001. 1.16)

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[Theme code (reference)]

2C088

[F term (reference)]

2C088 AA31 AA35 AA36 DA09 EA10

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**Summary**

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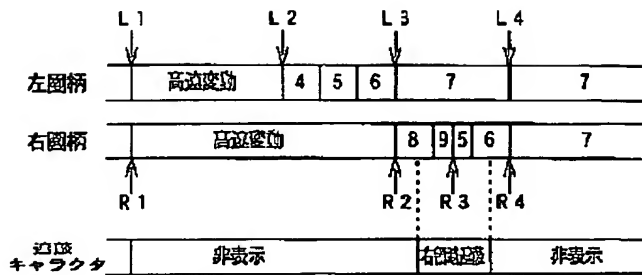
(57) [Abstract]

[Technical problem] The game machine which it slides without needing many control signals, and can be directed is offered.

[Means for Solution] In right figure handle display area, the pattern after 1 pattern of a halt pattern is expressed as the timing of right figure handle substitution in right figure handle display area at the same time it shakes in left figure handle display area and change is started. Then, change of a pattern is performed by low-speed change, and substitution to a pattern which is different from predetermined order to the timing of right figure handle substitution is performed. Thus, it slides by performing substitution to a different pattern from predetermined order, and production is performed.

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[Translation done.]



L 1 : 変動開始

L 2 : 左図柄差替、低速変動

L 3 : 左図柄入れ変動

L 4 : 左図柄差替え (同図柄)

R 1 : 変動開始

R 2 : 右図柄差替、低速変動

R 3 : 右図柄差替え

R 4 : 右図柄入れ変動

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## CLAIMS

[Claim(s)]

[Claim 1] The adjustable display which can perform an adjustable display for two or more kinds of identification information in predetermined order is included. On condition that it became the specific display mode defined beforehand, while the display result of adjustable display is the game machine which will be in an advantageous specific game state controllable and controls advance of a game for a game person The game control means which transmit the adjustable display-control signal which specifies the adjustable display time of identification information at least according to advance of a game, The aforementioned adjustable display is controlled based on the adjustable display time of the identification information specified for every adjustable display-control signal transmitted from the aforementioned game control means. It has the display-control means which can indicate the identification information by adjustable. the aforementioned display-control means The special control which performs the display control which

substitutes the identification information displayed at the specification time defined beforehand when indicating the identification information by adjustable according to reception of the adjustable display-control signal of 1 for any or other identification information, without following in order of [ predetermined ] the above, The game machine characterized by it being possible to choose [ which does not perform the aforementioned special control ] any with control are usually performed, and to control the display state of the aforementioned adjustable display according to selection.

[Claim 2] Usually, the game machine according to claim 1 with which the display control which substitutes identification information for the same identification information at the specification time defined beforehand is performed in control.

[Claim 3] The adjustable display which can perform an adjustable display for two or more kinds of identification information in predetermined order is included. On condition that it became the specific display mode defined beforehand, while the display result of adjustable display is the game machine which will be in an advantageous specific game state controllable and controls advance of a game for a game person The game control means which transmit the adjustable display-control signal which specifies the adjustable display time of identification information at least according to advance of a game, The aforementioned adjustable display is controlled based on the adjustable display time of the identification information specified for every adjustable display-control signal transmitted from the aforementioned game control means. It has the display-control means which can indicate the identification information by adjustable. the aforementioned display-control means The special control which displays the cover character which gives an updating indication of identification information impossible [ a check by looking ] when indicating the identification information by adjustable according to reception of the adjustable display-control signal of 1, The thing which do not display the aforementioned cover character and for which the aforementioned adjustable display is usually controlled by any with control they are is possible. in the aforementioned special control From the identification information currently displayed at the time of the start of a display of a cover character, to the identification information displayed at the time of the end of a display of a cover character The 1st number in the predetermined order of the above shifts by identification information. in the aforementioned usual control From the identification information currently displayed at the time corresponding to the time of the start of a display of a cover character when the aforementioned special control is chosen The game machine characterized by the 2nd different number from the 1st number of the above shifting to the identification information displayed at the time corresponding to the time of the end of a display of a cover character by identification information.

[Claim 4] The game machine according to claim 3 which performs specially the display control which substitutes identification information during the display of a cover character at any or other identification information, without following in

predetermined order by control.

[Claim 5] Two or more kinds of specific display modes are prepared. a display-control means When displaying a specific display mode on adjustable display as a display result, after displaying which specific display mode of two or more kinds of specific display modes, It is possible to perform the re-lottery production display of whether to display other specific display modes as a display result, and it sets to the aforementioned re-lottery production display. The game machine according to claim 3 or 4 which displays a cover character, covers a specific display mode, eliminates a cover character after predetermined period progress, and displays the specific display mode as a display result.

[Claim 6] The game machine according to claim 5 using the character similar to the identification information displayed as a cover character at the time of the end of a display of a cover character.

[Claim 7] The claim 1 from which the selection probability of whether control is performed specially or to usually perform control differs according to the kind of received adjustable display-control signal, or a game machine according to claim 6.

[Claim 8] Adjustable display is the claim 1 which has two or more adjustable viewing areas, and performs either control or usually control specially simultaneously in two or more adjustable viewing areas of all or two or more adjustable viewing areas, or a game machine according to claim 7.

[Claim 9] Extraordinarily the claim 1 that can form a reach mode by control, or a game machine according to claim 8.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the game machine with which the display result in adjustable display will be in a specific game

state advantageous to a game person controllable especially on condition that it became the specific display mode defined beforehand about game machines with which a game is performed according to operation of a game person, such as a pachinko game machine and a slot machine.

[0002]

[Description of the Prior Art] As a game machine, game media, such as a game sphere, are discharged to a game field with a launcher, and when a game medium wins a prize of winning-a-prize fields, such as a winning-a-prize mouth prepared in the game field, there are some which the awarded balls of a predetermined individual pay out to a game person. Furthermore, the adjustable display from which a display state can change is prepared, and there are some which were constituted so that it might be controlled by the advantageous specific game state for a game person, on condition that the display result of an adjustable display became the specific display mode defined beforehand.

[0003] In a pachinko game machine, a specific combination and the specific bird clapper of a display mode as which the display result of the adjustable display which displays a pattern (identification information) specially was determined beforehand are usually called "great success." If great success occurs, it will shift to the great success game state where a large winning-a-prize mouth carries out number-of-times opening of predetermined, and a hit ball tends to win a prize for example. And in each open period, if winning a prize to the large winning-a-prize mouth of a predetermined individual (for example, ten pieces) is, a large winning-a-prize mouth will be closed. And the number of times of opening of a large winning-a-prize mouth is being fixed to the number of times of predetermined (for example, 16 rounds). In addition, a released time (for example, 29.5 seconds) is decided about each opening, and if a released time passes even if the number of winning a prize does not reach a predetermined individual, a large winning-a-prize mouth will be closed. Moreover, when a large winning-a-prize mouth closes and predetermined conditions (for example, winning a prize in V zone prepared in the large winning-a-prize mouth) are not satisfied, a great success game state is ended.

[0004] Moreover, in the stage where a derivation indication of the part of the display results of two or more adjustable displays is not yet given among the combination of the display mode of "" other than the combination of great success" is a gap", the state of fulfilling the display conditions from which the display mode of the adjustable display by which a derivation indication of the display result is already given serves as combination of a specific display mode is called "reach." A game person performs a game, enjoying how great success is generated.

[0005] The game advance in a game machine is controlled by the game control means by the microcomputer etc. Since the mode of adjustable presenting of the identification information displayed on adjustable display crosses variably, the capacity of the program about an adjustable display control is large. Therefore, it is difficult to control the identification information displayed on adjustable display by

the microcomputer of the game control means which have a limit in program capacity, and it is a best policy to use the microcomputer other than the microcomputer of game control means for display controls (display-control means).

[0006] When the microcomputer for display controls is prepared, game control means need to send an adjustable display-control signal to the microcomputer for display controls suitably according to advance of a game, in order to take the synchronization with a game control state and an adjustable display-control state. In this case, the adjustable display-control signal for specifying various kinds of information about the identification information displayed on an adjustable display is sent out to the microcomputer for display controls.

[0007]

[Problem(s) to be Solved by the Invention] If game control means judge, a control signal is sent out about all the contents of a display displayed on adjustable display and it is possible since the control burden of game control means becomes large, it is desirable to constitute so that a display-control means may determine the contents of a display. however, in performing two or more production from which the change timing of identification information differs Since it is necessary to prepare an adjustable display-control signal for two or more production of every from which change timing differs, The production (the so-called "skid production") stopped by identification information which changes renewal of identification information from a low-speed state to a high-speed state, and is different from the usual processing before identification information stops When it was going to carry out apart from the usual production which does not perform skid production, the adjustable display-control signal needed to be prepared separately. Therefore, when it was going to perform skid production, the number of adjustable display-control signals increased, and there was a problem that the control burden of game control means will become large.

[0008] this invention aims at offering the game machine which it slides without needing many adjustable display-control signals, and can be directed in the composition in which a display-control means to perform the adjustable display control of adjustable display based on the control signal received from game control means is prepared.

[0009]

[Means for Solving the Problem] The game machine by this invention contains the adjustable display which can perform an adjustable display for two or more kinds of identification information in predetermined order. On condition that it became the specific display mode defined beforehand, while the display result of adjustable display is the game machine which will be in an advantageous specific game state controllable and controls advance of a game for a game person The game control means which transmit the adjustable display-control signal which specifies the adjustable display time of identification information at least according to advance of a game, Adjustable display is controlled based on the adjustable display time of the

identification information specified for every adjustable display-control signal transmitted from game control means. It has the display-control means which can indicate the identification information by adjustable. a display-control means The special control which performs the display control which substitutes the identification information displayed at the specification time defined beforehand when indicating the identification information by adjustable according to reception of the adjustable display-control signal of 1 for any or other identification information, without following in predetermined order, It chooses [ which does not control specially ] any with control are usually performed, and is characterized by it being possible to control the display state of adjustable display according to selection.

[0010] Usually, it may be constituted at the specification time defined beforehand by control, for example, so that the display control which substitutes identification information for the same identification information may be performed.

[0011] Moreover, the game machine of this invention contains the adjustable display which can perform an adjustable display for two or more kinds of identification information in predetermined order. On condition that it became the specific display mode defined beforehand, while the display result of adjustable display is the game machine which will be in an advantageous specific game state controllable and controls advance of a game for a game person The game control means which transmit the adjustable display-control signal which specifies the adjustable display time of identification information at least according to advance of a game, Adjustable display is controlled based on the adjustable display time of the identification information specified for every adjustable display-control signal transmitted from game control means. It has the display-control means which can indicate the identification information by adjustable. a display-control means The special control which displays the cover character which gives an updating indication of identification information impossible [ a check by looking ] when indicating the identification information by adjustable according to reception of the adjustable display-control signal of 1, The thing which do not display a cover character and for which adjustable display is usually controlled by any with control they are is possible. specially in control From the identification information currently displayed at the time of the start of a display of a cover character, to the identification information displayed at the time of the end of a display of a cover character The 1st number in predetermined order shifts by identification information. usually in control It is characterized by the 2nd different number from the 1st number shifting to the identification information displayed at the time corresponding to the time of the end of a display of a cover character by identification information from the identification information currently displayed at the time corresponding to the time of the start of a display of a cover character when control is chosen specially.

[0012] Specially, you may consist of control, for example, so that the display control which substitutes identification information during the display of a cover character at any or other identification information, without following in predetermined order

may be performed.

[0013] When two or more kinds of specific display modes are prepared and a display-control means displays a specific display mode on adjustable display as a display result, after displaying which specific display mode of two or more kinds of specific display modes, It is possible to perform the re-lottery production display of whether to display other specific display modes as a display result, and it sets to a re-lottery production display. You may consider as the composition which displays a cover character, covers a specific display mode, eliminates a cover character after predetermined period progress, and displays the specific display mode as a display result.

[0014] You may consider as the composition using the character similar to the identification information displayed as a cover character at the time of the end of a display of for example, a cover character.

[0015] It may be constituted so that the selection probability of whether control is performed specially or to usually perform control may change with kinds of received adjustable display-control signal.

[0016] Adjustable display has two or more adjustable viewing areas, and it may be constituted so that either control or usually control may be simultaneously performed specially in two or more adjustable viewing areas of all or two or more adjustable viewing areas.

[0017] Control may consider as the composition which can form a reach mode specially.

[0018]

[Embodiments of the Invention] Hereafter, 1 operation gestalt of this invention is explained with reference to a drawing. First, the composition of the whole pachinko game machine which is an example of a game machine is explained. The front view with which drawing 1 saw the pachinko game machine 1 from the transverse plane, the whole rear view in which drawing 2 shows the internal structure of the pachinko game machine 1, and drawing 3 are the rear view which saw the mechanism board of the pachinko game machine 1 from the tooth back. In addition, although the gestalt of the following operations explains a pachinko game machine to an example, the game machine by this invention may not be restricted to a pachinko game machine, for example, may be a coin game machine etc. Moreover, it is also applicable to the game machine and slot machine of a picture formula.

[0019] As shown in drawing 1, the pachinko game machine 1 has the glass door frame 2 formed in the shape of a frame. The hit ball supply pan 3 is shown in the lower front face of the glass door frame 2. The hit ball operation handle (operating knob) 5 which discharges the surplus sphere saucer 4 which stores the reservoir sphere with which it overflowed from the hit ball supply pan 3, and a hit ball is formed in the lower part of the hit ball supply pan 3. Behind the glass door frame 2, the game board 6 is attached removable. Moreover, the game field 7 is established in the front face of the game board 6.

[0020] The adjustable display 8 containing the adjustable display 9 for indicating two or more kinds of patterns by adjustable and the adjustable drop (usually pattern drop) 10 by the 7 segment Light Emitting Diode is formed near the center of the game field 7. Moreover, the passage storage drop (usually storage drop for patterns) 41 which consists of four Light Emitting Diodes is formed in the lower part of the adjustable drop 10. With the form of this operation, three pattern display area, the "left", "inside", and the "right", is shown in the adjustable display 9. The passage gate 11 to which a hit ball is led is established in the flank of the adjustable display 8. The hit ball which passed through the passage gate 11 is led to the direction of the starting winning-a-prize mouth 14 through the sphere outlet 13. There is a gate switch 12 which detects the hit ball which passed through the passage gate 11 in the path between the passage gate 11 and the sphere outlet 13. Moreover, the winning-a-prize sphere included in the starting winning-a-prize mouth 14 is led to the tooth back of the game board 6, and is detected by the starting mouth switch 17. Moreover, the adjustable winning-a-prize sphere equipment 15 which performs switching action is formed in the lower part of the starting winning-a-prize mouth 14. Adjustable winning-a-prize sphere equipment 15 is made an open state by the solenoid 16.

[0021] The opening-and-closing board 20 made an open state by the solenoid 21 in a specific game state (great success state) is formed in the lower part of adjustable winning-a-prize sphere equipment 15. With the form of this operation, the opening-and-closing board 20 serves as a means to open and close a large winning-a-prize mouth. The winning-a-prize sphere into which it went on the other hand (V zone) among the winning-a-prize spheres led to the tooth back of the game board 6 from the opening-and-closing board 20 is detected by V winning-a-prize switch 22. Moreover, the winning-a-prize sphere from the opening-and-closing board 20 is detected by the count switch 23. The starting winning-a-prize storage drop 18 which has four displays which display the number of winning-a-prize spheres included in the starting winning-a-prize mouth 14 on the lower part of the adjustable display 8 is formed. In this example, whenever there is starting winning a prize by making four pieces into an upper limit, the starting winning-a-prize storage drop 18 increases every one turned-on display. And whenever the adjustable display of the adjustable display 9 is started, one turned-on display is reduced.

[0022] In the game board 6, two or more winning-a-prize mouths 19 and 24 are formed, and winning a prize to each winning-a-prize mouth 19 and 24 of a game sphere is detected with the winning-a-prize mouth switches 19a and 24a formed by corresponding. On the outskirts of right and left of the game field 7, the ornament lamp 25 by which it is indicated by blink is formed into a game, and there is an out mouth 26 which absorbs the hit ball which did not win a prize in the lower part. Moreover, two loudspeakers 27 which emit a sound effect are formed in the right-and-left upper part of the outside of the game field 7. Game effect Light Emitting Diode 28a and the game effect lamps 28b and 28c are formed in the periphery of the

game field 7.

[0023] And in this example, the awarded-balls lamp 51 turned on at the time of premium sphere expenditure is formed near one loudspeaker 27, and the sphere piece lamp 52 turned on when a supply sphere goes out is formed near the loudspeaker 27 of another side. Furthermore, it is adjoined and installed in the pachinko game base 1 by drawing 1, and the card unit 50 which makes a sphere loan possible is also shown to it by inserting a prepaid card.

[0024] To the card unit 50 Whether it is in an usable state The shown use good display lamp 151, Whether the fraction display switch 152 for displaying the fraction on the frequency display Light Emitting Diode in which it is prepared near the hit ball supply pan 3, when a fraction (less than 100 yen number) exists in the balance information recorded in the card, and the card unit 50 correspond to which near pachinko game machine 1 As the card injection display lamp 154 and record medium in which it is shown that the card is thrown in in the shown direction drop 153 of a connection base and the card unit 50 When checking the mechanism of a card reader writer prepared in the rear face of the card slot 155 in which a \*\* card is inserted, and a card slot 155, the card unit lock 156 for releasing the card unit 50 is formed.

[0025] The hit ball discharged from the hit ball launcher goes into the game field 7 through a hit ball rail, and gets down from the game field 7 after that. If a hit ball is detected by the gate switch 12 through the passage gate 11, the display number of the adjustable drop 10 will be in the state of changing continuously. Moreover, if it is in the state which can start change of a pattern when a hit ball goes into the starting winning-a-prize mouth 14 and is detected by the starting mouth switch 17, the pattern in the adjustable display 9 will begin rotation. If it is not in the state which can start change of a pattern, starting winning-a-prize storage will be increased one.

[0026] Rotation of the picture in the adjustable display 9 stops, when fixed time passes. The combination of the picture at the time of a halt shifts that it is the combination of a great success pattern to a great success game state. That is, it opens until the opening-and-closing board 20 carries out fixed time progress, or until the hit ball of the predetermined number (for example, ten pieces) wins a prize. And if a hit ball wins a prize to a specific winning-a-prize field during opening of the opening-and-closing board 20 and it is detected by V winning-a-prize switch 22, the right of continuation will occur and opening of the opening-and-closing board 20 will be performed again. Number-of-times (for example, 15 rounds) permission of predetermined of the generating of the right of continuation is carried out.

[0027] When the combination of the picture in the adjustable display 9 at the time of a halt is the combination of the great success pattern accompanied by probability change, the probability which is next becoming it a great success becomes high. Namely, it will be in the still more advantageous state for a game person called a high probability state. Moreover, when the halt pattern in the adjustable drop 10 is a

predetermined pattern (hit pattern), only in a predetermined time, adjustable winning-a-prize sphere equipment 15 will be in an open state. Furthermore, in the high probability state, while the probability which the halt pattern in the adjustable drop 10 hits, and becomes a pattern is raised, the released time and the number of times of opening of adjustable winning-a-prize sphere equipment 15 are raised.

[0028] Next, the structure of the rear face of the pachinko game machine 1 is explained with reference to drawing 2. At the tooth back of the adjustable display 8, as shown in drawing 2, the sphere reservoir tank 38 is formed in the upper part of the mechanism board 36, and where the pachinko game machine 1 is installed in a game machine installation island, a game sphere is supplied to the sphere reservoir tank 38 from the upper part. The game sphere in the sphere reservoir tank 38 results in sphere expenditure equipment through a guide 39.

[0029] The expenditure control board 37 in which the microcomputer for awarded-balls control which performs the relay substrate 33 for relaying the signal between the game control boards (the main substrate) 31, and the adjustable display-control units 29 and the game control boards 31 in which it was covered by the adjustable display-control unit 29 and the substrate case 32 which control the adjustable display 9 through the relay substrate 30, and the microcomputer for game control etc. was carried, and expenditure control of a game sphere was carried is installed in the mechanism board 36. Furthermore, the ramp-control substrate 35 for sending a signal to the hit ball launcher 34 which discharges a hit ball to the game field 7 using the turning effort of a motor, the game effect lamp and Light Emitting Diodes 28a, 28b, and 28c and the awarded-balls lamp 51, and the sphere piece lamp 52 is installed in the lower part of the mechanism board 36.

[0030] Moreover, drawing 3 is the rear view which saw the mechanism board of the pachinko game machine 1 from the tooth back. As it passes along a guide 39 and is shown in drawing 3, the ball stored by the sphere reservoir tank 38 passes the sphere piece detectors (sphere piece switch) 187a and 187b, and results in sphere expenditure equipment 97 through ball feeding gutters 186a and 186b. Although the sphere piece switches 187a and 187b are switches which detect the existence of the game sphere in a game sphere path, the sphere piece pilot switch 167 which detects shortage of the supply sphere in the sphere tank 38 is also formed. The game sphere paid out of sphere expenditure equipment 97 is supplied to the hit ball supply pan 3 prepared in the front face of the pachinko game machine 1 through the connection mouth 45. The surplus ball path 46 which is open for free passage on the surplus ball saucer 4 prepared in the front face of the pachinko game machine 1 is formed in the side of the connection mouth 45. many premium spheres based on winning a prize pay out -- having -- the hit ball supply pan 3 -- full -- becoming -- just -- being alike -- if a game sphere pays out further after a game sphere reaches the connection mouth 45, a game sphere should pass the surplus ball path 46 -- it is led to the surplus ball saucer 4 If a game sphere furthermore pays out, the sensing lever 47 presses the full switch 48, and the full switch 48 turns on. In the state,

while rotation of the stepping motor in sphere expenditure equipment 97 stops and operation of sphere expenditure equipment 97 stops, the drive of the hit ball launcher 34 is also stopped.

[0031] Drawing 4 is the block diagram showing an example of the circuitry in the main substrate 31. In addition, the expenditure control board 37, the ramp-control substrate 35, the sound control board 70, the discharge control board 91, and the display-control substrate 80 are also shown in drawing 4. The basic circuit 53 which controls the pachinko game machine 1 in the main substrate 31 according to a program, The switching circuit 58 which gives the signal from the gate switch 12, the starting mouth switch 17, V winning-a-prize switch 22, the count switch 23, the winning-a-prize mouth switches 19a and 24a, and awarded-balls count switch 301A to the basic circuit 53, The solenoid circuit 59 which drives the solenoid 21 grade which opens and closes the solenoid 16 and the opening-and-closing board 20 which open and close adjustable winning-a-prize sphere equipment 15 according to the instructions from the basic circuit 53 is carried.

[0032] Moreover, the information output circuit 64 which outputs the great success information which shows generating of great success according to the data given from the basic circuit 53, the effective starting information which shows the number of the starting winning-a-prize sphere used for the image display start of the adjustable display 9, the probability-changing information which shows that probability change arose to host computers, such as a hole management computer, is included.

[0033] The basic circuit 53 contains ROM54 which memorizes the program for game control etc., RAM55 which is an example of the storage means used as work memory, CPU56 which performs control action according to a program, and the I/O Port section 57. With the gestalt of this operation, ROM54 and RAM55 are built in CPU56. That is, CPU56 is 1 chip microcomputer. In addition, that, as for 1 chip microcomputer, RAM55 should just be built in at least, even if ROM54 and the I/O Port section 57 are external, they may be built in. Moreover, the I/O Port section 57 is a terminal in a microcomputer in which information I/O is possible.

[0034] Furthermore, the address decoding circuit 67 which outputs the signal for decoding the address signal given to a power up from the system-reset circuit 65 and the basic circuit 53 for resetting the basic circuit 53 to the main substrate 31, and choosing the I/O Port of either of the I/O Port sections 57 as it is formed. In addition, although there is also switch information inputted into the main substrate 31 from sphere expenditure equipment 97, they are omitted in drawing 4.

[0035] The hit ball launcher which hits a game sphere and is discharged is driven with the drive motor 94 controlled by the circuit on the discharge control board 91. And the driving force of a drive motor 94 is adjusted according to the control input of an operating knob 5. That is, it is controlled by the circuit on the discharge control board 91 so that a hit ball is discharged at the speed according to the control input of an operating knob 5.

[0036] In addition, with the gestalt of this operation, while the ramp-control means carried in the ramp-control substrate 35 performs the display control of the starting storage drop 18 formed in the game board 6, the gate passage storage drop 41, and the ornament lamp 25, the display control of the game effect lamp and Light Emitting Diodes 28a, 28b, and 28c prepared in the frame side, the awarded-balls lamp 51, and the sphere piece lamp 52 is performed. Here, a ramp-control means is an example of emitter control means. Moreover, the display control of the adjustable display 9 which indicates the pattern by adjustable specially, and the adjustable drop 10 which usually indicates the pattern by adjustable is performed by the display-control means carried in the display-control substrate 80.

[0037] Drawing 5 is the block diagram showing the circuitry in the display-control substrate 80 with the output port (ports 0 and 2) 570,572 and the output-buffer circuits 620 and 62A of LCD (liquid crystal display)82 which is the example of 1 realization of the adjustable display 9, the adjustable drop 10, and the main substrate 31. From an output port (output port 2) 572, 8-bit data are outputted and a 1-bit strobe signal (INT signal) is outputted from an output port 570.

[0038] CPU101 for display controls will receive a display-control command through input-buffer circuit 105A, if it operates according to the program stored in control data ROM102 and an INT signal is inputted through a noise filter 107 and input-buffer circuit 105B from the main substrate 31. 74HC540 and 74HC14 which are general-purpose IC can be used as input-buffer circuits 105A and 105B. In addition, when CPU101 for display controls does not build in the I/O Port, an I/O Port is prepared between the input-buffer circuits 105A and 105B and CPU101 for display controls.

[0039] And CPU101 for display controls performs the display control of the screen displayed on LCD82 according to the received display-control command. Specifically, the instructions according to the display-control command are given to VDP103. VDP103 reads required data from a character ROM 86. VDP103 generates the image data for displaying on LCD82 according to the inputted data, and outputs R, G, B signal, and a synchronizing signal to LCD82.

[0040] In addition, the character ROM 86 which stores the oscillator circuit 85 for giving a clock of operation to the reset circuit 83 for resetting VDP103 and VDP103 and image data with high operating frequency in drawing 5 is shown. The image data with the high operating frequency stored in a character ROM 86 is a picture which consists of the person and animal which are displayed on LCD82 or a character, a figure, or a sign.

[0041] The input-buffer circuits 105A and 105B can pass a signal only in the direction which goes to the display-control substrate 80 from the main substrate 31. Therefore, there is no room to transmit a signal from the display-control substrate 80 side to the main substrate 31 side. Namely, as for the input-buffer circuits 105A and 105B, input port constitutes an irreversible information input means. Even if unjust reconstruction is added to the circuit in the display-control substrate 80, the

signal outputted by unjust reconstruction does not get across to the main substrate 31 side.

[0042] In addition, although the output of an output port 570,572 may be outputted to the display-control substrate 80 as it is, signal transduction of one directivity from the main substrate 31 to the display-control substrate 80 can be made more reliable by establishing the output-buffer circuits 620 and 62A in which signal transduction is possible only in an one way. Namely, as for the output-buffer circuits 620 and 62A, an output port constitutes an irreversible information output means.

[0043] Moreover, as a noise filter 107 which intercepts a RF signal, although for example, 3 terminal capacitor and a ferrite bead are used, though a noise rides on a display-control command between substrates, the influence is removed by existence of a noise filter 107. In addition, you may prepare a noise filter also in the output side of the buffer circuits 620 and 62A of the main substrate 31.

[0044] Next, operation of a game machine is explained. Drawing 6 is a flow chart which shows the main processing which CPU56 in the main substrate 31 performs. If a power supply is switched on to a game machine and CPU56 starts, in main processing, CPU56 will perform required initial setting first.

[0045] In initial-setting processing, CPU56 is first set as interrupt inhibition (Step S1). Next, interrupt mode is set as interrupt mode 2 (Step S2), and the stack-pointer specification address is set as a stack pointer (Step S3). And a built-in device register is initialized (step S4). Moreover, after initializing CTC (the counter/timer) and PIO (parallel input/output port) which are a built-in device (built-in circumference circuit) (Step S5), RAM is set as an accessible state (Step S6).

[0046] CPU56 used with the gestalt of this operation also builds in the I/O Port (PIO), and the timer/counter circuit (CTC). Moreover, CTC is equipped with two an external clock / timer trigger input CLK/TRG 2 and 3, and two timer output ZC/TO 0 and 1.

[0047] Three kinds of following modes are prepared for CPU56 used with the gestalt of this operation as the mode of interruption (INT) in which a mask is possible. In addition, if interruption in which a mask is possible occurs, CPU56 saves the content of a program counter to a stack while setting it as an interrupt inhibition state automatically.

[0048] Interrupt mode 0: The built-in device which performed the interruption request sends out a RST instruction (1 byte) or a CALL instruction (3 bytes) on the internal data bus of CPU. Therefore, CPU56 executes the instruction of the address specified by the address or the CALL instruction corresponding to the RST instruction. At the time of reset, CPU56 becomes interrupt mode 0 automatically. Therefore, in initial-setting processing, it is necessary to perform processing for setting it as interrupt mode 1 or interrupt mode 2 to set it as interrupt mode 1 or interrupt mode 2.

[0049] Interrupt mode 1: When interruption is received, it is the mode which always

flies to 0038 (h) addresses.

[0050] Interrupt-mode 2: The address compounded from the interruption vector (1-byte [ : ] least significant bit 0) which the value (1 byte) and built-in device of a specific register (I register) of CPU56 output is the mode which shows an interruption address. That is, an interruption address is the address shown by 2 bytes by which the high order address was made the value of a specific register, and the low rank address was made the interruption vector. Therefore, interrupt processing can be installed in the eventh arbitrary (it is discontinuous) street. Each built-in device has the function which sends out an interruption vector, when performing an interruption request.

[0051] Therefore, if set as interrupt mode 2, it will become possible to become possible to process easily the interruption request from each built-in device, and to install interrupt processing in the arbitrary positions in a program. Furthermore, interrupt mode 1 is easy also for differing and preparing each interrupt processing for every interruption generating factor. As mentioned above, with the gestalt of this operation, CPU56 is set as interrupt mode 2 in Step S2 of initial-setting processing.

[0052] And it is checked whether data protection processing (for example, power failure generating NMI processing of addition of parity data etc.) of a backup RAM field has been performed at the time of power off (Step S7). With the gestalt of this operation, when unexpected power off arises, processing for protecting the data of a backup RAM field is performed. Let the case where such protection processing is performed be those with backup. If those without backup are checked, CPU56 will perform initialization processing.

[0053] With the gestalt of this operation, it is checked according to the state of the backup flag set as a backup RAM field at the time of power off whether backup data are in a backup RAM field. In this example, if "55H" is set as the backup flag field as shown in drawing 7, those with backup (ON state) are meant, and if values other than "55H" are set up, those without backup (OFF state) are meant in it.

[0054] If those with backup are checked, CPU56 will perform data check (this example parity check) of a backup RAM field. When it restores after unexpected power off arose, since the data of a backup RAM field must have been saved, a check result becomes normal. Since an internal state cannot be returned to the state at the time of power off when a check result is not normal, initialization processing performed by the power up which it is not at the power failure restoration time is performed.

[0055] If the check result is normal (Step S8), CPU56 will perform game state restoration processing for returning the internal state of game control means, and the control state of electrical-part control means, such as a display-control means, to the state at the time of power off (step S9). And the evacuation value of PC (program counter) saved to the backup RAM field is set as PC, and returns to the address.

[0056] In initialization processing, CPU56 performs RAM clear processing first (Step

S11). Moreover, initializing processing which sets initial value as predetermined working areas (for example, usually the random number counter for a pattern judging, usually the buffer for a pattern judging, specially the right figure handle buffer in the pattern left, an expenditure command storing pointer, etc.) is also performed.

Furthermore, processing for initializing a sub substrate (the ramp-control substrate 35, the expenditure control board 37, the voice-control substrate 70, display-control substrate 80) is performed (Step S13). The processing which initializes a sub substrate is processing which sends out the command for initial setting.

[0057] And a setup of the register of CTC prepared in CPU56 so that a timer interruption may start periodically every 2ms is performed (Step S14). That is, the value which is equivalent to 2ms as initial value is set as a predetermined register (time constant register). And since it considers as interrupt inhibition in Step S1 of initial-setting processing, interruption is permitted before finishing initialization processing (Step S15).

[0058] If execution (Steps S11-S15) of initialization processing is completed, it will shift to the loop processing by which the random number update process for a display (Step S16) is performed in main processing.

[0059] With the gestalt of this operation, it is set up so that the built-in CTC of CPU56 may generate a timer interruption repeatedly. With the gestalt of this operation, a repeat period is set as 2ms. \*\* [ generating of a timer interruption / perform / game control processing of Steps S21-S31 / CPU56 / as shown in drawing 8 / and ]

[0060] In game control processing, first, through a switching circuit 58, CPU56 inputs the state of switches, such as the gate sensor 12, the starting mouth switch 17, the count sensor 23, and the winning-a-prize mouth switches 19a, 19b, 24a, and 24b, and performs those state judgments (switch processing : step S21).

[0061] Subsequently, various unusual diagnostic processes are performed by the self-checking function with which the interior of the pachinko game machine 1 is equipped, and according to the result, if required, an alarm will be emitted (error processing : step S22).

[0062] Next, processing which updates each counter which shows each random number for a judgment, such as a random number for a great success judging used for game control, is performed (Step S23). CPU56 performs processing which updates further random numbers for a display, such as a random number which determines the kind of halt pattern, (Step S24).

[0063] Drawing 9 is explanatory drawing showing each random number. Each random number is used as follows.

- (1) Random 1 : determine whether generate great success (= for a great success judging specially for pattern determination).
- (2) Determine the combination of the pattern at the time of the (3) random 3:great success for blank pattern determination under random 2-1-2-3:right and left (= for great success pattern determination specially for a pattern judging).

(4) Determine the change pattern at the time of random 4:reach (for change pattern determination).

[0064] In addition, the game effect is heightened — random numbers other than the random number of above-mentioned (1) – (4) are also used for accumulating At Step S23, CPU56 counts up the counter for generating the random number for a great success judging of (1), and the random number for a great success pattern judging of (3) (1 addition). That is, they are the random numbers for a judgment and random numbers other than these are random numbers for a display.

[0065] Furthermore, CPU56 performs pattern process processing specially (Step S25). By pattern process control, processing to which it corresponds according to a pattern process flag specially in order to control the pachinko game machine 1 in predetermined sequence according to a game state is selected and performed specially. And the value of a pattern process flag is specially updated during each processing according to a game state. Moreover, pattern process processing is usually performed (Step S26). By pattern process processing, processing to which it usually corresponds according to a pattern process flag in order to usually control the display state of the pattern drop 10 in predetermined sequence is usually selected and performed. And the value of a pattern process flag is usually updated during each processing according to a game state.

[0066] Subsequently, CPU56 performs processing which sets the display-control command about a pattern as the predetermined field of RAM55 specially, and sends out a display-control command (display-control command control processing : step S27).

[0067] Furthermore, CPU56 performs information output processing which outputs data, such as great success information supplied to for example, a hole administrative computer, starting information, and probability change information, (Step S29).

[0068] Moreover, CPU56 performs drive instructions in the solenoid circuit 59, when predetermined conditions are satisfied (Step S30). The solenoid circuit 359 drives solenoids 49 and 54 according to drive instructions, and makes the starting winning-a-prize mouth 14 or the opening-and-closing board 53 an open state or a closed state.

[0069] And CPU56 performs awarded-balls processing which performs a setup of the number of awarded balls based on the detection output of the switches 46a, 50, and 56 for detecting winning a prize to each winning-a-prize mouth etc. (Step S31). Specifically according to winning-a-prize detection, expenditure control command is outputted to the expenditure control board 37. CPU for expenditure control carried in the expenditure control board 37 drives sphere expenditure equipment 76 according to expenditure control command.

[0070] By the above control, game control processing will be started every 2ms with the gestalt of this operation. In addition, although game control processing is performed by timer-interruption processing, only the set of a flag in which it is

shown that interruption occurred is made, and game control processing may be made to perform in timer-interruption processing with the gestalt of this operation in main processing.

[0071] Moreover, a setup of a timer interruption is made in main processing, and since game control processing is performed by the timer-interruption processing based on the timer interruption which the internal timer of CPU56 generates periodically during execution of loop processing, all the game control processings are performed certainly. That is, since it does not return to loop processing until all the game control processings are performed, it is guaranteed that all the processings of each under game control processing carry out the completion of execution.

[0072] As explained above, with the gestalt of this operation, interrupt mode 2 is set up by initial-setting processing to CPU56 which builds in CTC and PIO. Therefore, the periodical timer-interruption processing using Built-in CTC is easily realizable. Moreover, timer-interruption processing can be installed in the arbitrary positions on a program. Moreover, the switch detection processing using Built-in PIO etc. is easily realizable by interrupt processing. Consequently, program composition is simplified and the effect of a program development man day decreasing can be acquired.

[0073] Drawing 10 is explanatory drawing showing an example of a pattern during the right and left used with the gestalt of this operation. Each pattern displayed as a pattern during right and left is under right and left, and as shown in drawing 10, with the gestalt of this operation, it is the ten same patterns. A display of the pattern of the pattern number 0 displays [ next ] the pattern of the pattern number 9. And during right and left, if patterns stop together by "1", "3", "5", "7", or "9", they will be in a high probability state. That is, they serve as a probability-changing figure.

[0074] Drawing 11 is a flow chart which shows an example of the program of the special pattern process processing which CPU56 performs. The special pattern process processing shown in drawing 11 is concrete processing of Step S25 in the flow chart of drawing 8. In case CPU56 performs pattern process processing specially, after it performs change shortening timer subtraction processing (Step S310), it processes either of Steps S300-S309 according to an internal state. A change shortening timer is a timer for setting up change time, when the change time of a pattern is shortened specially.

[0075] Waiting processing for special pattern change (Step S300): Wait to carry out hit ball winning a prize at the starting winning-a-prize mouth 14, and for the starting mouth switch 17 to turn on. While carrying out the number of starting winning-a-prize storage +one if the starting mouth switch 17 turns on, and the number of starting winning-a-prize storage is not full, the random number for great success determination etc. is extracted.

[0076] Special pattern judging processing (Step S301): If it will be in the state where the adjustable display of a pattern can be started specially, the number of starting winning-a-prize storage will be checked. If the number of starting winning-a-prize

storage is not 0, it will determine whether to consider as a gap whether according to the value of the random number for great success determination currently extracted, it considers as great success.

[0077] Halt pattern setting processing (Step S302): Determine the halt pattern of a pattern during right and left.

[0078] Reach operation setting processing (Step S303): While determining whether carry out reach operation based on the combination of the halt pattern under right and left, when considering as reach is determined, determine the change period at the time of reach according to the value of the random number for change pattern determination.

[0079] Complete-diagram handle change start processing (Step S304): Control so that the change start of the complete diagram handle is carried out in the adjustable display 8. At this time, the information which orders it the last halt pattern and a change mode during right and left is transmitted to the display-control substrate 80. After finishing processing, an internal state (process flag) is updated so that it may shift to Step S305.

[0080] Waiting processing for a complete-diagram handle halt (Step S305): If a predetermined time (time shown with the change shortening timer of Step S310) passes, it will control so that the complete diagram handle displayed in the adjustable display 8 is stopped. At this time, the information which orders it a halt of a complete diagram handle is transmitted to the display-control substrate 80. And when a halt pattern is the combination of a great success pattern, an internal state (process flag) is updated so that it may shift to Step S306. When that is not right, an internal state is updated so that it may shift to Step S300.

[0081] Large winning-a-prize mouth opening start processing (Step S306): Start the control which opens a large winning-a-prize mouth. Specifically, while initializing a counter and a flag, a solenoid 21 is driven and a large winning-a-prize mouth is opened. Moreover, with a process timer, the execution time of processing is set up during large winning-a-prize mouth opening, and a great success flag (flag which shows that it is under great success) is set. After finishing processing, an internal state (process flag) is updated so that it may shift to Step S307.

[0082] under large winning-a-prize mouth opening — processing (Step S307): -- processing which checks the control which sends out the display-control command data of a large winning-a-prize mouth round display to the display-control substrate 80, and formation of the closing conditions of a large winning-a-prize mouth is performed. If the closing conditions of a final large winning-a-prize mouth are satisfied, an internal state will be updated so that it may shift to Step S308.

[0083] Specific field effective-time processing (Step S308): Supervise the existence of passage of V winning-a-prize switch 22, and perform processing which checks formation of great success game state continuation conditions. When the conditions of great success game state continuation are satisfied and there is still the remaining round, an internal state is updated so that it may shift to Step S306.

Moreover, when great success game state continuation conditions are not satisfied in a predetermined effective time, or when all rounds are finished, an internal state is updated so that it may shift to Step S309.

[0084] Great-success end processing (Step S309): Perform the display for reporting to a game person that the great success game state was completed. If the display is completed, an internal state will be updated so that it may shift to Step S300.

[0085] Drawing 12 is a flow chart which shows the processing which judges that the hit ball won a prize of the starting winning-a-prize mouth 14. If a hit ball wins a prize of the starting winning-a-prize mouth 14 prepared in the game board 6, the starting mouth switch 17 turns on. For example, specially, if the thing of Step S300 of pattern process processing for which the starting mouth switch 17 turned on CPU56 through the switching circuit 58 is judged as the waiting processing for pattern change is shown in drawing 12 (Step S41), it will check whether the number of starting winning-a-prize storage amounts to 4 which is maximum (Step S42). If the number of starting winning-a-prize storage does not amount to 4, the number of starting winning-a-prize storage is increased one (Step S43), and the value of each random number, such as a random number for a great success judging, is extracted. And they are stored in the random number value storage area corresponding to the value of the number of starting winning-a-prize storage (Step S44). In addition, when the number of starting winning-a-prize storage amounts to 4, processing which increases the number of starting winning-a-prize storage is not performed. That is, with the gestalt of this operation, the number of hit balls which won a prize of a maximum of four starting winning-a-prize mouths 17 is memorizable.

[0086] In special pattern process processing of Step S25, CPU56 checks the value of the number of starting winning-a-prize storage, as shown in drawing 13 (Step S51). if the number of starting winning-a-prize storage is not 0 — the number of starting winning-a-prize storage — while reading the value stored in the random number value storage area corresponding to  $=1$  (Step S52), the value of the number of starting winning-a-prize storage is reduced by one, and the value of each random number value storage area is shifted (Step S53) namely, each value stored in the random number value storage area corresponding to number of starting winning-a-prize storage  $=n$  ( $3 \leq n \leq 4$ ) — the number of starting winning-a-prize storage — it stores in the random number value storage area corresponding to  $=n-1$

[0087] And based on the value which read CPU56 at Step S52, i.e., the value of the random number for a great success judging currently extracted, hit/determines a gap (Step S54). Here, the random number for a great success judging is made to take the value of the range of 0-299. As shown in drawing 14, when the value is "3", for example, at the time of low probability, it determines "" is a gap, when it is decided that it will be great success" and it is the other value." At the time of high probability, when the value is "3", "7", "79", "103" or, and "107", for example, it determines "" is a gap, when it is decided that it will be great success" and it is the other value."

[0088] When judged with great success, the random number for great success pattern determination (random 3) is extracted, and a great success pattern is determined according to the value (Step S55). With the gestalt of this operation, each pattern of the pattern number set as the great success pattern table according to the value of the extracted random 3 is determined as a great success pattern. The pattern number under right and left corresponding to each of the combination of two or more kinds of great success patterns is set to the great success pattern table. Moreover, the change pattern of a pattern is determined based on the value read at Step S52, i.e., the value of the random number for change pattern determination (random 4) currently extracted, (Step S56).

[0089] When judged with a blank, CPU56 determines the halt pattern when not considering as great success. With the gestalt of this operation, a left figure handle is determined according to the value read at Step S52, i.e., the value of random 2-1 currently extracted, (Step S57). Moreover, an inside pattern is determined according to the value of random 2-2 (Step S58). And a right figure handle is determined according to the value of random 2-3 (Step S59). When a pattern is in agreement with a right-and-left pattern while being determined, the pattern corresponding to the value added to the value of the random number corresponding to the inside pattern one time is made not in agreement with a great success pattern here as a halt pattern of an inside pattern.

[0090] Furthermore, based on the value read at Step S52, i.e., the value of the random number for change pattern determination (random 4) currently extracted, CPU56 determines the change pattern of a pattern, when a right-and-left pattern becomes the same (i.e., when it is determined that reach is materialized) (Step S60).

[0091] When that by which change time was shortened as a change pattern at the time of a blank is also used in the state of high probability, in the high probability state, CPU56 determines whether to use or or the change pattern by which shortening was carried out which uses the change pattern at the time of the usual blank using a predetermined random number etc.

[0092] It is determined whether for the display mode of the pattern change based on starting winning a prize as mentioned above to consider as great success, or to consider as a reach mode or consider as a blank, and the combination of each halt pattern is determined.

[0093] In addition, the processing shown in drawing 13 is equivalent to processing when processing of Steps S301-S303 in the special pattern process processing shown in drawing 11 is shown collectively.

[0094] Next, sending out of a display-control command to the display-control substrate 80 is explained from the main substrate 31. Drawing 15 is explanatory drawing showing the signal line of the display-control command transmitted to the display-control substrate 80 from the main substrate 31. As shown in drawing 15, with the gestalt of this operation, a display-control command is transmitted to the display-control substrate 80 from the main substrate 31 by eight signal lines of the

display-control signals D0-D7. Moreover, between the main substrate 31 and the display-control substrate 80, the signal line of the display-control INT signal for transmitting a strobe signal is also wired.

[0095] A display-control command is 2-byte composition, as shown in drawing 16, the 1st byte of MODE (classification of a command) is expressed with the form of this operation, and the 2nd byte of EXT (kind of command) is expressed with it. The head bit (bit 7) of MODE data is surely set to "1", and the head bit (bit 7) of EXT data is surely set to "0." In addition, the command form shown in drawing 16 is an example, and may use other command forms. Moreover, although control command will be constituted from this example by two control signals, the number of control signals which constitutes control command may be 1, and may be plural [ three or more ].

[0096] Drawing 17 is the timing chart showing the relation of the 8-bit control signal and INT signal (strobe signal) which constitute the control command to the display-control substrate 80. If a predetermined period passes after the data of MODE or EXT are outputted to an output port as shown in drawing 16, CPU56 will make an ON state the INT signal which is a signal which shows data output. Moreover, an INT signal will be made into an OFF state if a predetermined period passes from there.

[0097] In addition, although the display-control command was explained, each control command sent out to other sub substrates is also the same as that of the form shown in drawing 16 and drawing 17 here.

[0098] Drawing 18 is explanatory drawing showing an example of the contents of the display-control command sent out to the display-control substrate 80. In the example shown in drawing 18, command 8000(H) -80XX(H) is a display-control command which specifies the change pattern of the special pattern in the adjustable display 8 which indicates the pattern by adjustable specially. In addition, the command which specifies a change pattern serves also as change start directions.

[0099] Command 8F00(H) and 8F01(H) are the special pattern power-up specification commands and common pattern power-up specification commands which are sent out to a power up. In addition, usually, a pattern power-up specification command is used when a display-control means usually performs pattern change control, and when the pattern drop 10 is usually controlled by the ramp-control means, it is not sent out to the display-control substrate 80. A display-control means will start the control which performs an initial display, if a pattern power-up specification command is received specially.

[0100] a command 91 -- XX (H) and 92 -- XX (H) and 93 -- XX(s) (H) are display-control commands which specify the halt pattern of left Nakamigi of a pattern specially. Moreover, command A0XX(H) is a display-control command (definite command) which directs a halt of an adjustable display of a pattern specially.

[0101] Command BXXX is a display-control command sent out from a great success game start before a great success game end. A command B300 (H) is a display-control command (great success pattern viewing command) which is predetermined

to predetermined timing in a great success game and which is a command sent out the number of times (for example, being the timing as which a great success pattern is displayed between each round the number of rounds -1 time), and specifies the display of a great success pattern. Moreover, a command C000 - EXXX are the display-control commands about change of a pattern, and the display state of the adjustable display 9 without regards to a great success game specially. And command D000(H) -D400(H) is usually a display-control command about the change pattern of a pattern.

[0102] The display-control means of the display-control substrate 80 will change the display state of the adjustable display 9 and the common pattern drop 10 according to the contents shown in drawing 18, if the display-control command mentioned above from the game control means of the main substrate 31 is received.

[0103] When it is going to output control command to each electrical-part control board (sub substrate) from game control means, a setup of a command transmitting table is performed. Drawing 19 is explanatory drawing showing the example of 1 composition of a command transmitting table. One command transmitting table consists of 3 bytes, and INT data are set as the 1st byte. Moreover, the 1st byte of MODE data of control command are set to the 2nd byte of command data 1. And the 2nd byte of EXT data of control command are set to the 3rd byte of command data 2.

[0104] In addition, although the EXT data itself may be set as the field of the command data 2, to the command data 2, the data (buffer the data) for specifying the address of the table on which EXT data are stored may be made to be set. With the form of this operation, if the bit 7 (work area reference bit) of the command data 2 is 0 as shown in drawing 20 (A), it is shown that the EXT data itself are set as the command data 2. In addition, such EXT data are data whose bit 7 is 0. Moreover, if a work area reference bit is 1 as shown in drawing 20 (B), it is other 7 bits (in drawing 20 (B)). since the case where 18 kinds of buffers are specified, respectively is assumed, a bit 4 - a bit 0 are used and the bit 6 and the bit 5 are made intact It is shown that it is the offset (compensation field for specifying the storing place of data) for specifying the address of the table on which EXT data are stored. in addition -- the 18 above-mentioned kinds of buffers -- for example, -- specially -- a pattern change pattern buffer -- specially -- a pattern left figure handle buffer -- specially -- the pattern buffer in a pattern -- a pattern right figure handle buffer etc. is contained specially

[0105] Drawing 21 is explanatory drawing showing the example of 1 composition of INT data. The bit 0 in INT data shows whether expenditure control command should be sent out to the expenditure control board 37. If a bit 0 is "1", what expenditure control command should be sent out for is shown. Therefore, CPU56 sets "01 (H)" as INT data for example, in awarded-balls processing (Step S31 of game control processing). Moreover, the bit 1 in INT data shows whether a display-control command should be sent out to the display appearance control board 165. If a bit 1

is "1", what a display-control command should be sent out for is shown. Therefore, CPU56 sets "02 (H)" as INT data for example, in display-control command control processing (Step S27 of game control processing). The bits 2 and 3 of INT data are bits which show whether a ramp-control command and a voice-control command should be sent out, respectively, if CPU56 becomes the timing which should send out those commands, will be pattern process processings etc. specially and will set INT data, the command data 1, and the command data 2 as the command transmitting table which the pointer (for example, specially pattern command transmitting pointer) has pointed out. When those commands are sent out, the applicable bit of INT data is set as "1", and MODE data and EXT data are set as the command data 1 and the command data 2.

[0106] With the gestalt of this operation, two or more command transmitting tables are prepared about each control command, respectively, and the command transmitting table which should be used is set up before command transmission. Moreover, you may set two or more command transmitting tables as one table. For example, as shown in drawing 22, one table containing two or more command transmitting tables which can store two or more display-control commands is prepared. Therefore, in display-control command control processing, from the command transmitting table which the pointer is putting, CPU56 sets up INT data, the command data 1, and the command data 2, and transmits a display-control command. And a pointer is updated. Then, transmitting processing of a display-control command is repeated until the command transmitting table specified by a pointer shows a termination code. In addition, you may make it constitute some tables (for example, table on which an expenditure number specification command is set up) prepared about each control command in ring buffer form.

[0107] Drawing 23 is a flow chart which shows the example of processing of the display-control command control processing (Step S27) in the game control processing shown in drawing 8. In addition, the processing shown in drawing 23 is an example of the command control processing including display-control command control processing. Display-control command control processing is processing including command output processing and INT signal output processing. In display-control command control processing, CPU56 evacuates the address (the content of a read-out pointer) of a command transmitting table to a stack etc. first (Step S331). And the INT data of the command transmitting table which the read-out pointer had pointed out are loaded to an argument 1 (Step S332). An argument 1 becomes the input to the command transmitting processing mentioned later. Moreover, the address which points out a command transmitting table is carried out +one (Step S333). Therefore, the address which points out a command transmitting table is in agreement with the address of the command data 1.

[0108] Then, CPU56 reads the command data 1 and sets them as an argument 2 (Step S334). An argument 2 also becomes the input to the command transmitting processing mentioned later. And a command transmitting manipulation routine is

called (Step S335).

[0109] Drawing 24 is a flow chart which shows a command transmitting routine. In a command transmitting routine, CPU56 sets it as the work area decided as a comparison value first (Step S351)., the data, i.e., the INT data, set as the argument 1. Subsequently, the number of times of transmission = 4 is set as the work area decided as the number of processing (Step S352). And the address of the port 1 for outputting an expenditure control signal is set to IO address (Step S353). With the gestalt of this operation, the address of a port 1 is the address of the output port for outputting an expenditure control signal. Moreover, the address of ports 2-4 is the address of the output port for outputting a display-control signal, a ramp-control signal, and a voice-control signal.

[0110] Next, CPU56 shifts a comparison value to the 1-bit right (Step S354). It is checked whether the carry bit has been set to 1 as a result of shift processing (Step S355). That the carry bit was set to 1 means that the bit by the side of the rightmost in INT data was "1." Although four shift processings are performed with the gestalt of this operation, when what expenditure control command should be sent out for is specified for example, a carry bit is set to 1 by the first shift processing.

[0111] When a carry bit is set to 1, in the data set as the argument 2, and this case, the command data 1 (namely, MODE data) are outputted to the address set up as the IO address (Step S356). Since the address of a port 1 is set as IO address when the first shift processing is performed, the MODE data of expenditure control command are then outputted to a port 1.

[0112] Subsequently, CPU56 subtracts the number of processing one time while adding IO address one time (Step S357) (Step S358). When the port 1 is shown before addition, the address of a port 2 is set to IO address by addition processing to IO address. A port 2 is a port for outputting a display-control command. And CPU56 returns to Step S354, if the value of the number of processing is checked (Step S359) and the value has not become 0. Shift processing is again performed at Step S354.

[0113] In the 2nd shift processing, the value of the bit 1 in INT data is extruded, and a carry flag is set to "1" or "0" according to the value of a bit 1. Therefore, the check of whether what a display-control command should be sent out for is specified is performed. The check of whether similarly what a ramp-control command and a voice-control command should be sent out for is specified by the 3rd time and 4th shift processing is performed. Thus, when each shift processing is performed, IO address corresponding to the command (expenditure control command, a display-control command, a ramp-control command, voice-control command) checked by shift processing is set to IO address.

[0114] Therefore, when a carry flag is set to "1", control command is sent out to a corresponding output port (a port 1 - port 4). That is, sending-out processing of the control command to each electrical-part control means can be performed by one

common module.

[0115] Moreover, in this way, since it is judged to which electrical-part control means control command should be outputted only by shift processing, whether control command's being outputted to which electrical-part control means and the processing to judge are simplified.

[0116] Next, CPU56 reads the content of the argument 1 in which the INT data before a shift processing start are stored (Step S360), and outputs the read data to a port 0 (Step S361). With the gestalt of this operation, the address of a port 0 is a port for outputting the INT signal about each control signal, and is a port for the bits 0-4 of a port 0 outputting an expenditure control INT signal, a display-control INT signal, a ramp-control INT signal, and a voice-control INT signal, respectively. By INT data, the bit corresponding to the output bit of the INT signal according to the control command (expenditure control command, a display-control command, a ramp-control command, voice-control command) outputted by processing of Steps S351-S359 is "1." Therefore, the INT signal corresponding to the control command (expenditure control command, a display-control command, a ramp-control command, voice-control command) outputted to either the port 1 - the port 4 is turned on.

[0117] Subsequently, CPU56 sets a predetermined value as a wait counter (Step S362), and it subtracts it every [ 1 ] until the value is set to 0 (Steps S363 and S364). This processing is processing for setting up the "on" period of the INT signal (control signal INT) shown in the timing chart of drawing 17 . If the value of a wait counter is set to 0, clear data (00) will be set up (Step S365), and the data will be outputted to a port 0 (Step S366). Therefore, an INT signal is turned off. And a predetermined value is set as a wait counter (Step S362), and it subtracts every [ 1 ] until the value is set to 0 (Steps S368 and S369). This processing is processing for setting up the period to the 1st EXT data output start from falling of an INT signal.

[0118] Therefore, the value set as a wait counter at Step S367 is a value which becomes sufficient period for all the electrical-part control means (CPU carried in the sub substrate) from which the period to the 1st EXT data output start from falling of an INT signal serves as a candidate for control command receiving to perform command reception certainly. Moreover, the value set as a wait counter is a value to which the period becomes longer than the time which processing of Steps S351-S359 takes.

[0119] The 1st byte of MODE data of control command are sent out as mentioned above. Then, CPU56 is Step S336 shown in drawing 23 , and adds the value which points out a command transmitting table one time. Therefore, the field of the 3rd byte of command data 2 is specified. CPU56 loads the content of the command data 2 to which it pointed to an argument 2 (Step S337). Moreover, it checks whether the value of the bit 7 (work area reference bit) of the command data 2 is "0" (Step S339). If it is not 0, the address will be computed by setting the start address of a

command extension data-address table to a pointer (Step S339), and adding the value of the bit 6 of the command data 2 – a bit 0 to the pointer (Step S340). And the data of the area which the address points out are loaded to an argument 2 (Step S341).

[0120] The EXT data in which it is sent out to electrical-part control means, and deals are set to the command extension data-address table one by one. Therefore, if the value of a work area reference bit is "1", the EXT data in the command extension data-address table according to the content of the command data 2 are loaded to an argument 2 by the above processing, and if the value of a work area reference bit is "0", the content of the command data 2 is loaded to an argument 2 as it is. In addition, even when EXT data are read from a command extension data-address table, the bit 7 of the data is "0."

[0121] Next, CPU56 calls a command transmitting routine (Step S342). Therefore, EXT data are sent out to the same timing as the case of sending out of MODE data. Then, CPU56 returns the address of a command transmitting table (Step S343), and updates the value of the read-out pointer which points out a command transmitting table (Step S344). When the value of a read-out pointer exceeds the position of the command transmitting table 12 shown in drawing 22, the value of a read-out pointer is returned to 0.

[0122] Furthermore, when non-transmitted control command is still set as the command transmitting table, it returns to Step S331. In addition, since control command will be continuously sent out when returning to Step S331, a delay time is set in order to vacate the interval between control command. Moreover, it is judged by comparing the value of for example, a command transmitting counter with the value of a read-out pointer whether non-transmitted control command is set up.

[0123] Each control command (expenditure control command, a display-control command, a ramp-control command, voice-control command) of 2-byte composition is transmitted to corresponding electrical-part control means by the command control processing module which is one control signal output module as mentioned above. Although incorporation processing of control command will be started in electrical-part control means if falling of the INT signal as a taking-in signal is detected, before incorporation processing is completed, the new signal from game control means is not outputted to a signal line about which electrical-part control means. That is, positive command reception is performed in each electrical-part control means. In addition, each electrical-part control means may start incorporation processing of control command in the standup of an INT signal. Moreover, you may make polarity of an INT signal into the case where it is shown in drawing 17, and reverse.

[0124] Furthermore, with the gestalt of this operation, when two or more control command is set as the command transmitting table, all control command is sent out by one command control processing. Since command control processing (for example, display-control command control processing) is started once at 2ms, in the

main processing starting period of 2ms, all control command is sent out after all. Moreover, with the gestalt of this operation, since two or more command transmitting tables are prepared for every [ to each control means ] control command (a display-control command, a ramp-control command, a voice-control command, expenditure control command), respectively for example, when control command is set as the command transmitting table of a display-control command, a ramp-control command, and a voice-control command It is also possible to send out all display-control commands, a ramp-control command, and a voice-control command by one command control processing. That is, those control command can be sent out simultaneously (meaning in 1 main processing starting period). On advance of game production, since the sending-out timing of those control command is generated simultaneously, being constituted in this way is convenient. However, since it generates regardless of advance of game production, generally expenditure control command is not sent out simultaneously with a display-control command, a ramp-control command, and a voice-control command.

[0125] Drawing 25 is a flow chart which shows the main processing which CPU101 for display controls performs. In main processing, initialization processing for first performing initial setting of 33ms timer for deciding the clearance of a RAM field, a setup of various initial value, and the starting interval of a display control etc. is performed (Step S701). Then, with the gestalt of this operation, CPU101 for display controls shifts to the loop processing which checks the surveillance (Step S702) of a timer-interruption flag. In addition, within a loop, processing which updates the counter for generating a predetermined random number is also performed (Step S710). And if a timer interruption occurs as shown in drawing 26 , CPU101 for display controls will set a timer-interruption flag (Step S711). In main processing, if the timer-interruption flag is set, CPU101 for display controls will clear the flag (Step S703), and will perform the following adjustable display-control processings.

[0126] In addition, with the gestalt of this operation, a timer interruption presupposes that it starts every 33ms. That is, adjustable display-control processing is started every 33ms. Moreover, although only a flag set is made and concrete adjustable display-control processing is performed in main processing with the gestalt of this operation in timer-interruption processing, you may perform adjustable display-control processing by timer-interruption processing.

[0127] In adjustable display-control processing, CPU101 for display controls analyzes the received display-control command first (command analysis executive operation : step S705). Subsequently, CPU101 for display controls performs display-control process processing (Step S708). In display-control process processing, the process corresponding to the present control state is chosen and performed among each process according to the control state. Then, it returns to Step S710.

[0128] Next, the display-control command reception from the main substrate 31 is explained. Drawing 27 is explanatory drawing showing the example of 1 composition of the command receive buffer for storing the display-control command received

from the main substrate 31. In this example, the command receive buffer of the ring buffer form which can six-piece store the display-control command of 2-byte composition is used. Therefore, a command receive buffer consists of 12 bytes of fields of the receiving command buffers 1-12. And the command receiving number counter which shows in which field the received command is stored is used. A command receiving number counter takes the value of 0-11. In addition, you may not necessarily be ring buffer form, for example, it is good in a pattern specification command storing field also considering command storing fields, such as three pieces ( $2 \times 3 = 6$  byte command receive buffer) and the other change pattern specification, as buffer composition like one piece ( $2 \times 1 = 2$  byte command receive buffer). Also in a voice-control means and a ramp-control means, it is good similarly as a buffer form which is not ring buffer form. In this case, a display-control means, a voice-control means, and a ramp-control means are controlled based on the newest command stored in storing fields, such as a change pattern. Thereby, it can respond to directions promptly from the main substrate 31.

[0129] Drawing 28 is a flow chart which shows the display-control command reception by interrupt processing. The INT signal for the display controls from the main substrate 31 is inputted into the interruption terminal of CPU101 for display controls. For example, if the INT signal from the main substrate 31 is turned on, interruption will start in CPU101 for display controls. And the reception of the display-control command shown in drawing 28 is started.

[0130] In the reception of a display-control command, CPU101 for display controls evacuates each register to a stack first (Step S670). In addition, although CPU101 for display controls will be automatically set as an interrupt inhibition state if interruption occurs, when CPU which will not be in an interrupt inhibition state automatically is used, it is desirable to publish an interrupt inhibition instruction (DI instruction) before execution of processing of Step S670. Subsequently, data are read from the input port currently assigned to the display-control command entry of data (Step S671). And it checks whether it is the 1st byte in the display-control command of 2-byte composition (Step S672).

[0131] It is checked by whether the head bit of the received command is "1" whether it is the 1st byte. It must be MODE data of the display-control commands which are 2-byte composition (the 1st byte) that a head bit is "1" (refer to drawing 16). Then, CPU101 for display controls is stored in the receiving command buffer which the command receiving number counter in a receive buffer field shows the received command noting that it will receive the 1st effective byte, if a head bit is "1" (Step S673).

[0132] If it is not the 1st byte in a display-control command, it will check whether the 1st byte has already been received (Step S674). It is checked by whether data effective in a receive buffer (receiving command buffer) are set up whether it has already received.

[0133] When the 1st byte is already received, it checks whether the head bit of the

received 1 byte is "0." And it stores in the receiving command buffer which the command receiving number counter +1 in a receive buffer field shows the received command noting that the 2nd effective byte will be received, if a head bit is "0" (Step S675). It must be EXT data of the display-control commands which are 2-byte composition (the 2nd byte) that a head bit is "0" (refer to drawing 16 ). In addition, processing will be ended if the head bit of the data with which the check result in Step S674 already received the 1st byte, out of which it came and which were received as the 2nd byte in a certain case is not "0."

[0134] In Step S675, storing of the 2nd byte of command data adds 2 to a command receiving number counter (Step S676). And it checks whether a command receiving counter is 12 or more (Step S677), and with 12 [ or more ], a command receiving number counter is cleared (Step S678). Then, it returns (Step S679) and the evacuated register is set as interruption permission (Step S680).

[0135] A display-control command is 2-byte composition, and consists of receiving sides possible [ distinction ] immediately the 1st (MODE) byte and the 2nd (EXT) byte. That is, it is detectable immediately in a receiving side whether the data as EXT were received for whether the data as MODE were received with a head bit. Therefore, as mentioned above, it can judge easily whether it is having received proper data. In addition, this is the same also about expenditure control command, a ramp-control command, and a voice-control command.

[0136] Drawing 29 is a flow chart which shows the example of command analysis processing (Step S705). Although the display-control command received from the main substrate 31 is stored in a receiving command buffer, in command analysis processing, the contents of the command stored in the receiving command buffer are checked.

[0137] In command analysis processing, CPU101 for display controls checks first whether the receiving command is stored in the command receive buffer (Step S681). It is judged when whether it is stored or not compares the value and read-out pointer of a command receiving counter. The case where both are in agreement is a case where the receiving command is not stored. When the receiving command is stored in the command receive buffer, CPU101 for display controls reads a receiving command from a command receive buffer (Step S682). In addition, if it reads, the value of a read-out pointer will be carried out +one.

[0138] If the read receiving command is a left figure handle specification command (Step S683), the EXT data of the command will be stored in the left halt pattern storage area of a storage area this time (Step S684), and a corresponding effective flag will be set (Step S685). In addition, it can be immediately recognized by the 1st (MODE data) byte in 2 bytes of display-control command whether it is a left figure handle specification command.

[0139] If the read receiving command is an inside pattern specification command (Step S686), the EXT data of the command will be stored in a halt-in storage area pattern storage area this time (Step S687), and a corresponding effective flag will be

set (Step S688). If the read receiving command is a right figure handle specification command (Step S689), the EXT data of the command will be stored in the right halt pattern storage area of a storage area this time (Step S690), and a corresponding effective flag will be set (Step S691). In addition, the left Nakamigi halt pattern storage area is established in RAM with which the display-control substrate 80 is equipped.

[0140] If the read receiving command is a change pattern command (Step S692), CPU101 for display controls will store the EXT data of the command in a change pattern storage area (Step S693), and will set a change pattern receiving flag (Step S694). In addition, the change pattern storage area is established in RAM with which the display-control substrate 80 is equipped.

[0141] When the read receiving commands are other display-control commands, the flag corresponding to a receiving command is set (Step S695).

[0142] Drawing 30 is explanatory drawing showing the random number for skid production which CPU101 for display controls treats. The random number for skid production is for determining whether perform skid production. In this example, renewal of the random number for a skid production judging is performed by the random number update process (Step S710) in the loop processing which checks the surveillance (Step S702) of a timer-interruption flag. In addition, the renewal of the random number for a skid production judging is not restricted when carrying out by random number update process, for example, it may be made to perform it by timer-interruption processing, and may be made to perform it by both for example, a random number update process and timer-interruption processing.

[0143] Drawing 31 is extracted explanatory drawing in which sliding, sliding with the random number for production, and showing an example of a relation with production. It is determined based on the EXT data in the display-control command which specifies a change pattern whether perform skid production. When a change pattern command is received, CPU101 for display controls specifies the judgment table matched with the EXT data of the received change pattern command while extracting the random number for skid production. For example, when the value of EXT data is a value (for example, refer to 00 (H) and drawing 33 ) which usually shows change, CPU101 for display controls is determined as the thing which extracted and which it slides, it will slide if the values of the random number for production are either 0-98, and is not directed, and it is determined that it will slide if an extraction value is 99, and it will direct. In being the value (refer to 01 (H) and drawing 33 ), as for reach, the value of EXT data usually indicates a gap to be, CPU101 for display controls is determined as the thing which extracted and which it slides, it will slide if the values of the random number for production are either 0-89, and is not directed, and it determines it that it will slide if extraction values are either 90-99, and it will direct. In addition, it is good also as composition which prepares two or more modes of skid production corresponding to the EXT data of the same change pattern command. Moreover, you may make it the probability that

skid production will be chosen turn into different probability for every EXT data of a change pattern command, and may make it turn into the same probability by the part or all EXT data.

[0144] Drawing 32 is explanatory drawing showing the change block used with the form of this operation. Each change block is stored in ROM which the display-control substrate 80 has. Although a change pattern table is constituted from this example by the combination of the change block shown in drawing 32, about a change pattern table, it mentions later. CPU101 for display controls performs predetermined operation according to the control program stored in each change block. Each change block is constituted by the combination of two or more pattern operation.

[0145] As shown in drawing 32, the complete diagram handle acceleration block is constituted by pattern operation which performs the usual background display, and each pattern operation which performs left Nakamigi's processing which starts the change display of a pattern specially. Moreover, a complete diagram handle high-speed block is constituted by each pattern operation under right and left which performs the high-speed change display of a pattern specially.

[0146] Pattern operation which performs processing whose right-and-left slowdown block A substitutes a left figure handle for the pattern in front of 3 patterns of a halt pattern, Pattern operation which performs the slowdown display of a left figure handle, pattern operation which performs shake change of a left figure handle, Pattern operation which performs processing which substitutes a right figure handle before 3 patterns of a halt pattern, It is constituted by pattern operation which performs the slowdown display of a right figure handle, pattern operation which does not display a cover character, pattern operation which substitutes a right figure handle for a predetermined pattern, and pattern operation which performs shake change of a right figure handle. The right-and-left slowdown block A is used when not performing skid production.

[0147] Moreover, pattern operation which performs processing whose right-and-left slowdown block B substitutes a left figure handle for the pattern in front of 3 patterns of a halt pattern, Pattern operation which performs the slowdown display of a left figure handle, pattern operation which performs shake change of a left figure handle, Pattern operation which performs processing which substitutes a right figure handle after 1 pattern of a halt pattern, It is constituted by pattern operation which performs the slowdown display of a right figure handle, pattern operation which displays a cover character, pattern operation which substitutes a right figure handle for a predetermined pattern, pattern operation which makes a cover character a non-display state, and pattern operation which performs shake change of a right figure handle. The right-and-left slowdown block B is used when performing skid production.

[0148] The inside pattern slowdown block is constituted by pattern operation which performs processing which substitutes an inside pattern before 5 patterns of a halt

pattern, pattern operation which performs the slowdown display of an inside pattern, and pattern operation which performs shake change. Moreover, it is constituted by pattern operation which usually displays the background used when reach shifts and a block performs reach production, pattern operation which carries out operation at the time of reach to a right-and-left pattern, pattern operation which substitutes an inside pattern for the pattern in front of 4 patterns of a halt pattern, pattern operation which indicates the inside pattern by slowdown, and pattern operation performed in shake change. Furthermore, it is constituted by pattern operation which displays the background usually used when a reach great success block performs reach production, pattern operation which carry out operation at the time of reach to a right-and-left pattern, pattern operation which substitute an inside pattern for the pattern in front of the 4 patterns of a halt pattern, pattern operation which perform the slowdown display of an inside pattern, pattern operation carry out the shake change of an inside pattern, and pattern operation display the background used at the time of great success.

[0149] Drawing 33 is explanatory drawing showing the EXT data of a change pattern command, and the relation of the contents of change (change pattern table). In addition, the display time (change time) set according to each EXT data and the skid selectivity which shows the probability that skid production will be chosen are also shown in drawing 33 . Since the EXT data and the contents of change of a change pattern command are matched as shown in drawing 33 , the contents of change of 1 are specified based on the EXT data of a change pattern command. Moreover, skid selectivity is set to the contents of change, respectively. Specifically according to the EXT data (namely, the contents of change) of a change pattern command, the judgment table (refer to drawing 31 ) used is determined.

[0150] Drawing 34 is explanatory drawing showing the example of the contents of a change pattern table. The change pattern table is set as ROM which the display-control substrate 80 has. As shown in drawing 34 , each change pattern table is prepared corresponding to the EXT data of a change pattern command, and it is \*\*\*\*\*. Moreover, each change pattern table is constituted by two or more change blocks, and each upset condition (change period in fluctuation velocity or its speed etc.) is set up. In this example, as shown in drawing 34 , each change pattern table is considered as the composition which can take any [ of the right-and-left pattern slowdown A and the right-and-left pattern slowdown B ] block, respectively. That is, the case where the right-and-left pattern slowdown A is chosen and performed according to one EXT data, and the right-and-left pattern slowdown B may be chosen and performed. Therefore, the production period of the production (with no skid) which is performed based on the right-and-left pattern slowdown A and which is carried out and the production period of the skid production performed based on the right-and-left pattern slowdown B are set as the same period.

[0151] Drawing 35 is a flow chart which shows the display-control process processing (Step S708) in the main processing shown in drawing 25 . In display-

control process processing, processing of either of Steps S800–S805 is performed according to the value of a display-control process flag. The following processings are performed in each processing.

[0152] Waiting processing for display-control command reception (Step S800):

Check whether the display-control command (change pattern command) which can specify change time has been received by command receive-interrupt processing. It is checked whether the flag which specifically shows that the change pattern command was received has been set. Such a flag is set when the receiving command stored in the receiving command buffer is a change pattern command.

[0153] Skid production setting processing (Step S801): While determining whether perform skid production, when performing skid production is determined, slide and determine the kind of production.

[0154] Complete-diagram handle change start processing (Step S802): Control so that change of a pattern is started during right and left.

[0155] Pattern change Naka processing (Step S803): While controlling the change timing of each upset condition (fluctuation velocity, a background, character) which constitutes a change pattern, supervise the end of change time. Moreover, halt control of a right-and-left pattern is performed.

[0156] Waiting setting processing for a complete-diagram handle halt (Step S804): Perform control which will stop change of a pattern and will display a halt pattern (definite pattern) at the time of the end of change time if the display-control command (definite command) which directs a complete diagram handle halt is received.

[0157] Great-success display processing (Step S805): Perform probability-changing great success display or control which is usually a great success display after the end of a change time.

[0158] Drawing 36 is a flow chart which shows the waiting processing for display-control command reception (Step S800). In the waiting processing for display-control command reception, CPU101 for display controls checks first whether the command non-received timer has carried out the time-out (Step S811). When the display-control command which shows change of a pattern from the main substrate 31 more than a predetermined period is not received, let command a non-received timer be a time-out. When a time-out is carried out, CPU101 for display controls performs control which displays a demonstration screen on the adjustable display 9 (Step S812).

[0159] If the command non-received timer has not carried out a time-out, it checks whether CPU101 for display controls has received the display-control command which can specify change time (Step S813). With the gestalt of this operation, the display-control command which can specify change time is either of the change pattern specification commands (change pattern specification #1– change pattern specification XX-1) shown in drawing 18 . When the display-control command which can specify change time is received, it slides on the value of a display-control

process flag, and changes into the value corresponding to production judging processing (Step S801) (Step S814).

[0160] When fluctuating a pattern specially, the display-control commands first transmitted to the display-control substrate 80 from the main substrate 31 are the command which shows change time, and a command which specifies the halt pattern of a pattern during right and left. They are stored in the definite command buffer.

[0161] Drawing 37 is a flow chart which shows skid production setting processing (Step S801). In skid production setting processing, CPU101 for display controls extracts the random number for skid production first (Step S821). Subsequently, the decision value table (refer to drawing 31) used based on the value of the EXT data of the received change pattern command is determined (Step S822). For example, if EXT data are 00 (H), the decision value table of change will usually be used (refer to drawing 31 and drawing 33).

[0162] And the decision value table determined as the extracted random number for production determines whether skid production is performed (Step S823). In not performing skid production, in the change pattern table chosen based on EXT data, it sets up a table including processing (with no skid production) of A blocks of right-and-left slowdowns as a change pattern table to be used (Step S824). On the other hand, in performing skid production, it sets up the table which includes processing (those with skid production) of B blocks of right-and-left slowdowns in the change pattern table chosen based on EXT data as a change pattern table to be used (Step S825). And CPU101 for display controls changes the value of a display-control process flag into the value corresponding to complete diagram handle change start processing (Step S802) (Step S826).

[0163] Here, the sending-out gestalt of the command which specifies the halt pattern of a pattern during the change pattern command which shows change time, and right and left is explained. The command which specifies the halt pattern of a pattern during the change pattern command which shows change time, and right and left is transmitted in the display-control command control processing mentioned above. In case these commands are sent out, as shown in drawing 38, INT data, the command data 1, and the command data 2 are set as the command transmitting table which the command transmitting number counter has pointed out by CPU56. First, the 1st command data (command data for specifying the change pattern set as the command transmitting table +0) constituted with the three above-mentioned data is transmitted. Subsequently, in the display-control command control processing performed (since the repeat period to which the built-in CTC of CPU56 generates a timer interruption repeatedly is set as 2ms with the gestalt of this operation), the following command data (command data for specifying the special pattern left halt pattern set as the command transmitting table +1) are transmitted between the following 2ms. And if such processing is repeated and a pattern command transmitting pointer points to a termination code specially, it will be in the state where command data are not transmitted until a command transmitting table is

specially specified effectively with a pattern command transmitting pointer. Thus, it is received by the command reception mentioned above and the transmitted command data are stored in a receiving command buffer. In addition, each value which shows the command shown in drawing 38 is an example, and 81 (H) which shows the right figure handle in the pattern left specially, 82 (H), and 83 (H) are the commands for displaying "1", "2", and "3" on the adjustable display 9, respectively.

[0164] Drawing 39 is a flow chart which shows the complete diagram handle change start processing (Step S802) in display-control process processing. In complete diagram handle change start processing, CPU101 for display controls starts a change time timer first (Step S840). Subsequently, change of a pattern is started specially (Step S841), and the value of a display-control process flag is made into the value corresponding to processing during pattern change (Step S842).

[0165] Drawing 40 is a flow chart which shows processing (Step S803) during pattern change. In processing, CPU101 for display controls performs a change display to the adjustable display 9 according to the content shown in the change pattern table set up at Step S824 or Step S825 during pattern change (Step S851). Specifically, according to the change pattern table set up, CPU101 for display controls controls VDP103 so that the display in the adjustable display 9 is performed.

[0166] Subsequently, it checks whether the change time timer has carried out the time-out of CPU101 for display controls (Step S852). When a change time timer carries out a time-out, the value of a display-control process flag is changed into the value corresponding to the waiting processing for a complete diagram handle halt (Step S804) (Step S853).

[0167] Drawing 41 is a flow chart which shows the waiting processing for a complete diagram handle halt (Step S804). In the waiting processing for a complete diagram handle halt, it checks whether CPU101 for display controls has received the display-control command which directs a complete diagram handle halt (Step S871). If the display-control command which directs a complete diagram handle halt is received, control which stops a pattern in the halt pattern memorized will be performed (Step S872). And in order to supervise the time to reception of the following display-control command, command a non-received timer is started (Step S873).

[0168] When the display-control command which specifies a complete diagram handle halt is not received, it checks whether the supervisory timer is carrying out the time-out (Step S875). When a time-out is carried out, it judges that a certain abnormalities occurred and control which displays an error screen on the adjustable display 9 is performed (Step S876).

[0169] When processing Step S873 and a great success pattern is displayed at Step S872, CPU101 for display controls sets the value of a display-control process flag as the value corresponding to great success display processing (Step S805) (Step S874). In addition, in not displaying a great success pattern at Step S872, CPU101 for display controls sets the value of a display-control process flag as the value

corresponding to the waiting processing for display-control command reception (Step S800) (when a gap pattern is displayed).

[0170] Drawing 42 is a flow chart which shows great success display processing (Step S805). In great success display processing, CPU101 for display controls judges whether it is probability-changing great success (Step S881). CPU101 for display controls can judge whether it is probability-changing great success for example, based on a definite pattern. If it is probability-changing great success, CPU101 for display controls will perform the display control which displays "probability-changing great success" on the adjustable display 9 (Step S882). Specifically, display directions of "probability-changing great success" are notified to VDP103. Then, VDP103 creates the image data of the directed display. Moreover, image data is compounded with a background image. If it is not probability-changing great success, CPU101 for display controls will perform the display control which displays "great success" on the adjustable display 9 (Step S883).

[0171] Then, in great success display processing, the display control of the adjustable display 9 is performed based on the display-control command in the great success game state transmitted from the main substrate 31. For example, the display of the number of rounds etc. is performed. And reception of the display-control command which shows the end of a great success game from the main substrate 31 sets the value of a display-control process flag as the value corresponding to the waiting for display-control command reception (Step S800) (Step S885). (Step S884)

[0172] Hereafter, the example of the display state of the processing timing of adjustable display processing which CPU101 for display controls performs based on the same change pattern command, and the adjustable display 9 in that case is explained. The rough content of production (refer to drawing 33) is specified by the change pattern command from the main substrate 31, and processing shown below based on the content of production determined and determined by the display-control substrate 80 is performed about the detailed contents of production (for example, special pattern displayed [ whether skid production is performed and ] in the case of the mode of skid production, and a change display). In addition, the upset condition of a right-and-left pattern is explained, and explanation of the upset condition of an inside pattern is omitted here.

[0173] First, processing when not performing skid production is determined (when the right-and-left pattern slowdown A is chosen) is explained. Drawing 43 (A) and drawing 43 (B) are timing charts which show the example of the processing timing of adjustable display processing (with no skid production) which CPU101 for display controls performs based on reception of a change pattern command. In addition, drawing 43 (B) does not show the example of the processing timing in the case of performing substitution to this pattern at the specific time (for example, T3), and drawing 43 (A) shows the example of the processing timing when not carrying out substitution to this pattern at the specific time. Since the processing shown in

drawing 43 (A) and the processing shown in drawing 43 (B) have the same contents displayed by the adjustable display 9, the same change pattern command can define. Therefore, in this example, a predetermined change pattern command is received, when not performing skid production is determined, it is chosen by the display-control substrate 80 whether processing [ which ] is performed, and processing [ which ] is performed by it. Drawing 44 is explanatory drawing showing the example of the display state of the adjustable display 9 when processing of drawing 43 (A) or drawing 43 (B) is performed.

[0174] With the form of this operation, as shown in drawing 43, high-speed change is performed by the timing (L1, R1) of a change start in the pattern display area of the "left" in the adjustable display 9, and the "right" ( drawing 44 (A)). Then, after [ when the pattern in front of 3 patterns of a halt pattern is displayed in "left" pattern display area to the timing (L2) of left figure handle substitution ( drawing 44 (B)) ] being controlled like, change of three patterns is performed by low-speed change ( drawing 44 (C) – drawing 44 (E)). And in "left" pattern display area, a pattern is repeated and fluctuated to the right direction and opposite direction of the change direction to the start timing (L3) of left figure handle shake change. That is, a display control is carried out to the so-called shake upset condition. As for shake change, a pattern says the thing which shake up and down and which is displayed. In addition, it is good also as not the mode that sways a pattern for shake change up and down but a mode swayed right and left.

[0175] In the pattern display area of the "right" in the adjustable display 9, the pattern in front of 3 patterns of a halt pattern is displayed in "right" pattern display area to the timing (R2) of right figure handle substitution at the same time it shakes in "left" pattern display area and change is started ( drawing 44 (E)). Then, in the example shown in drawing 43 (A), change of three patterns is performed by low-speed change as usual, without performing substitution to this pattern ( drawing 44 (F) – drawing 44 (H)). Moreover, in the example shown in drawing 43 (B), in case change of three patterns is performed by low-speed change, substitution to this pattern is performed to the timing (R3) of ( drawing 44 (F) – drawing 44 (H)), and right figure handle substitution. By performing substitution to this pattern, it seems that change of three patterns in low-speed change was performed as usual in the pattern display area of the "right" in the adjustable display 9 like the case where processing by drawing 43 (A) is performed, for a game person. Moreover, since production which does not perform a skid to the same processing timing as the case (refer to drawing 45 ) where skid production later mentioned by performing substitution to this pattern to the timing (R3) of right figure handle substitution is performed can be performed, if it does not carry out with the case where skid production is performed, the same control program can be used.

[0176] And to the start timing (R4) of right figure handle shake change, it shakes in "right" pattern display area, and a display control is carried out to upset condition. Moreover, in the example shown in drawing 43 (A), the indicator-chart handle "7" of

"left" pattern display area is continued and displayed, without performing substitution to this pattern. On the other hand, in the example shown in drawing 43 (B), control substituted for this pattern in "left" pattern display area to left figure handle substitution timing (L4) is performed. Thus, since left figure handle substitution timing (L4) also performs substitution to this pattern, production which does not perform a skid to the same processing timing as the case (refer to drawing 45) where skid production mentioned later is performed is realized. Then, CPU101 for display controls of the display-control substrate 80 performs shake change control of a right-and-left pattern until an inside pattern is decided. And if the display-control command which directs a complete diagram handle halt from the main substrate 31 is received, it will be in the definite state where terminate the shake upset condition of a right-and-left pattern, and a pattern does not move during right and left.

[0177] Since a change pattern is specified based on the judgment result about whether the EXT data and skid production of a change pattern command which the halt pattern under right and left at the time of a change start was notified, and received are performed, CPU101 for display controls can also determine the pattern in front of 3 patterns which should be substituted while being able to recognize the change timing of each control action. It substitutes, a pattern is notified to VDP103, and VDP103 displays the notified pattern regardless of the determined pattern which is then displayed.

[0178] Next, processing when performing skid production is determined (when the right-and-left pattern slowdown B is chosen) is explained. Drawing 45 is a timing chart which shows the example of the processing timing of adjustable display processing (those with skid production) which CPU101 for display controls performs based on reception of a change pattern command. Drawing 46 is explanatory drawing showing the example of the display state of the adjustable display 9 when processing of drawing 45 is performed. In addition, processing of drawing 45 and drawing 46 is performed based on the same change pattern command as the processing shown in drawing 43 and drawing 44 which were mentioned above, and the timing of L1-L4, and R1-R4 is the same timing.

[0179] With the form of this operation, as shown in drawing 45, high-speed change is performed by the timing (L1, R1) of a change start in the pattern display area of the "left" in the adjustable display 9, and the "right" (drawing 46 (A)). Then, after [ when the pattern in front of 3 patterns of a halt pattern is displayed in "left" pattern display area to the timing (L2) of left figure handle substitution (drawing 46 (B)) ] being controlled like, change of three patterns is performed by low-speed change (drawing 46 (C) - drawing 46 (E)). And in "left" pattern display area, a pattern is repeated and fluctuated to the right direction and opposite direction of the change direction to the start timing (L3) of left figure handle shake change. That is, a display control is carried out to the so-called shake upset condition. As for shake change, a pattern says the thing which shake up and down and which is

displayed. In addition, it is good also as not the mode that sways a pattern for shake change up and down but a mode swayed right and left.

[0180] In the pattern display area of the "right" in the adjustable display 9, the pattern after 1 pattern of a halt pattern is displayed in "right" pattern display area to the timing (R2) of right figure handle substitution at the same time it shakes in "left" pattern display area and change is started ( drawing 46 (E)). Then, although change of a pattern is performed by low-speed change ( drawing 46 (F) – drawing 46 (J)), this example performs substitution to the pattern in front of 2 patterns of a halt pattern to the timing (R3) of right figure handle substitution. That is, it is substituted for a different pattern from the usual order (predetermined order) of a list. In this example, as a cover character (here curtain) is displayed before the timing (R3) of right figure handle substitution ( drawing 46 (F), drawing 46 (G)), it considers as the state where the substitution ( drawing 46 (G), drawing 46 (H)) to the pattern in front of 2 patterns of a halt pattern cannot be checked by looking. After finishing the substitution to the pattern in front of 2 patterns of a halt pattern, the display of a cover character is ended and it considers as the state which can check a right figure handle by looking ( drawing 46 (I)). Thus, by performing substitution to a different pattern from the usual order of a list, it slides in the pattern display area of the "right" in the adjustable display 9, and production is performed. And to the start timing (R4) of right figure handle shake change, it shakes in "right" pattern display area, and a display control is carried out to upset condition. Moreover, control substituted for this pattern in "left" pattern display area to left figure handle substitution timing (L4) is performed. Then, CPU101 for display controls of the display-control substrate 80 performs shake change control of a right-and-left pattern until an inside pattern is decided. And if the display-control command which directs a complete diagram handle halt from the main substrate 31 is received, it will be in the definite state where terminate the shake upset condition of the pattern display area pattern of the "right" in the right-and-left adjustable display 9, and a pattern does not move during right and left.

[0181] As explained above, it sets to the display-control substrate 80. to right figure handle substitution timing (R3) The processing which does not direct by sliding by substituting for this pattern, or the predetermined order of a list is having constituted so that processing which directs by sliding by substituting for a different pattern might be performed. It can perform now by sliding based on the same change pattern command, and choosing production and the usual production. Therefore, it becomes possible for it to become unnecessary to define the change pattern command of the exclusive use for performing skid production, and to reduce the number of commands. Moreover, since it is not necessary to perform determination processing of whether to direct by sliding in game control means, it becomes possible to make the control burden of game control means mitigate.

[0182] Moreover, since it was made to perform control updated for the same pattern as mentioned above, a display top (on appearance) can define the case which

updates internally where renewal of a pattern is not performed, and the case where renewal of identification information also performs a display top, based on the same change pattern command.

[0183] Moreover, the cover character which gives an updating indication of a pattern impossible [ a check by looking ] with the form of operation mentioned above is displayed, and updating and substitution of a pattern can be performed, without changing the movement of the pattern specified by the change pattern command, since it carried out as the composition which substitutes the pattern made into the check-by-looking impossible state for a different pattern from the predetermined order of an array. Therefore, it becomes possible to perform skid production and the usual production which does not perform skid production based on the same change pattern command.

[0184] In addition, although it was made to substitute the pattern displayed on the pattern display area of the "right" in the adjustable display 9 with the form of operation mentioned above, it is good also as composition which substitutes the pattern displayed on "left" pattern display area.

[0185] The processing in the case of directing by sliding by substituting hereafter the pattern displayed on the pattern display area of the "left" in the adjustable display 9 is explained. Drawing 47 is a timing chart which shows the example of the processing timing of adjustable display processing (those with skid production) which CPU101 for display controls performs based on reception of a change pattern command. Drawing 48 is explanatory drawing showing the example of the display state of the adjustable display 9 when processing of drawing 47 is performed. In addition, processing of drawing 47 and drawing 48 is performed based on the same change pattern command as the processing shown in drawing 43 and drawing 44 which were mentioned above, and the timing of L1-L4, and R1-R4 is the same timing.

[0186] In this example, as shown in drawing 47, high-speed change is performed by the timing (L1, R1) of a change start in the pattern display area of the "left" in the adjustable display 9, and the "right" ( drawing 48 (A)). Then, after [ when the pattern after 1 pattern of a halt pattern is displayed in "left" pattern display area to the timing (L2) of left figure handle substitution ( drawing 48 (B)) ] being controlled like, change of three patterns is performed by low-speed change ( drawing 48 (C) - drawing 48 (E)). And in "left" pattern display area, a pattern is repeated and fluctuated to the right direction and opposite direction of the change direction to the start timing (L3) of left figure handle shake change. That is, a display control is carried out to the so-called shake upset condition. As for shake change, a pattern says the thing which shake up and down and which is displayed. In addition, it is good also as not the mode that sways a pattern for shake change up and down but a mode swayed right and left.

[0187] In the pattern display area of the "right" in the adjustable display 9, the pattern in front of 3 patterns of a halt pattern is displayed in "right" pattern display area to the timing (R2) of right figure handle substitution at the same time it shakes

in "left" pattern display area and change is started ( drawing 48 (E)). Then, although change of a pattern is performed by low-speed change ( drawing 48 (F) – drawing 48 (H)), this example performs substitution to the same pattern to the timing (R3) of right figure handle substitution. And to the start timing (R4) of right figure handle shake change, it shakes in "right" pattern display area, and a display control is carried out to upset condition. Moreover, control substituted for a halt pattern in "left" pattern display area to left figure handle substitution timing (L4) is performed ( drawing 48 (H)). Therefore, it substitutes for a different pattern from the usual order of a list. Then, CPU101 for display controls of the display-control substrate 80 performs shake change control of a right-and-left pattern until an inside pattern is decided. And if the display-control command which directs a complete diagram handle halt from the main substrate 31 is received, it will be in the definite state where terminate the shake upset condition of the pattern display area pattern of the "right" in the right-and-left adjustable display 9, and a pattern does not move during right and left.

[0188] In this example, as a cover character (here curtain) is displayed before the timing (L4) of left figure handle substitution ( drawing 48 (F), drawing 48 (G)), it considers as the state where the substitution ( drawing 48 (G), drawing 48 (H)) to a halt pattern cannot be checked by looking. After finishing the substitution to a halt pattern, the display of a cover character is ended and it considers as the state which can check a left figure handle by looking ( drawing 48 (I)). Thus, by performing substitution to a different pattern from the usual order of a list, it slides in the pattern display area of the "left" in the adjustable display 9, and production is performed.

[0189] Even if it is the case where it constitutes as mentioned above, it can perform by sliding based on the same change pattern command, and choosing production and the usual production. Therefore, it becomes possible for it to become unnecessary to define the change pattern command of the exclusive use for performing skid production, and to reduce the number of commands. Moreover, since it is not necessary to perform determination processing of whether to direct by sliding in game control means, it becomes possible to make the control burden of game control means mitigate.

[0190] In addition, although the substitution processing in the timing (L4) of left figure handle substitution is covered with a cover character and the game person was preventing from checking by looking with the gestalt of other operations mentioned above, it is good also as composition which does not cover substitution processing. Drawing 49 is explanatory drawing showing other examples of the display state of the adjustable display 9 when processing of drawing 47 is performed. In addition, processing of drawing 47 and drawing 49 is performed based on the same change pattern command as the processing shown in drawing 43 and drawing 44 which were mentioned above. What is necessary is for a left figure handle to put, and to replace in accordance with a halt of a right figure handle, for example, just to

make it be in a reach state, in not covering the substitution processing in the timing (L4) of left figure handle substitution, as shown in drawing 49 .

[0191] Moreover, although it is made to direct with the form of each operation mentioned above by sliding by substituting the pattern displayed on the pattern display area of the "right" in the adjustable display 9, or the pattern displayed on the pattern display area of the "left" in the adjustable display 9 for a different pattern from the usual order of a list It is good also as composition which substitutes the pattern displayed on the "left" and "right" pattern display area for a different pattern from the usual order of a list. In this case, what is necessary is just to substitute the pattern displayed on the "left" and "right" pattern display area to predetermined substitution timing for this pattern in the processing which does not perform skid production based on the same change pattern command. Moreover, you may make it cover both right-and-left pattern display both [ one side or ] in the case of substitution.

[0192] Drawing 50 is explanatory drawing showing the example of the display state of the adjustable display 9 when processing which substitutes the pattern displayed on the "left" and "right" pattern display area for the pattern from which the usual order of a list differs is performed. As shown in drawing 50 , in the pattern display area of the "left" in the adjustable display 9, and the "right", high-speed change is performed to the timing of a change start ( drawing 50 (A)). Then, after [ when the pattern in front of 5 patterns of a halt pattern is displayed in "left" pattern display area to the timing of left figure handle substitution ( drawing 50 (B)) ] being controlled like, change of two patterns is performed by low-speed change ( drawing 50 (C), drawing 50 (D)). And in "left" pattern display area, a pattern is repeated and fluctuated to the right direction and opposite direction of the change direction to the start timing of left figure handle shake change. That is, a display control is carried out to the so-called shake upset condition. As for shake change, a pattern says the thing which shake up and down and which is displayed. In addition, it is good also as not the mode that sways a pattern for shake change up and down but a mode swayed right and left.

[0193] In the pattern display area of the "right" in the adjustable display 9, the pattern after 1 pattern of a halt pattern is displayed in "right" pattern display area to the timing of right figure handle substitution at the same time it shakes in "left" pattern display area and change is started ( drawing 50 (D)). Then, change of a pattern is performed by low-speed change ( drawing 50 (E), drawing 50 (F)). And to the start timing of right figure handle shake change, it shakes in "right" pattern display area, and a display control is carried out to upset condition.

[0194] In this example, by the timing which the right figure handle would shake and would be in upset condition, a cover character is displayed on "left" pattern display area and "right" pattern display area, and a right-and-left pattern is made into the state which cannot be checked by looking ( drawing 50 (F), drawing 50 (G)). In the state which "left" pattern display area and "right" pattern display area cannot

check by looking, substitution ( drawing 50 (H)) to a halt pattern is performed. After finishing the substitution to a halt pattern, the display of a cover character is ended and it considers as the state which can check a right-and-left pattern by looking ( drawing 50 (I)). Thus, by performing substitution to a different pattern from the usual order of a list in pattern display area on either side, in the pattern display area of the "left" in the adjustable display 9, and "right" display area, it slides simultaneously, and production is performed. In addition, you may be made to perform skid production of "left" pattern display area, and skid production of "right" pattern display area separately in time. Then, CPU101 for display controls of the display-control substrate 80 performs shake change control of a right-and-left pattern until an inside pattern is decided. And if the display-control command which directs a complete diagram handle halt from the main substrate 31 is received, it will be in the definite state where terminate the shake upset condition of the pattern display area pattern in the adjustable display 9, and a pattern does not move during right and left.

[0195] As mentioned above, since it considered as the composition which substitutes the pattern of "left" pattern display area, and the pattern of "right" pattern display area for a different pattern from the usual order of an array, respectively, it becomes possible to perform colorful production. Moreover, it is good also as composition which substitutes for a pattern which is different from the usual order of an array similarly about "inner" pattern display area.

[0196] Moreover, although the curtain was made into the example and the form of each operation mentioned above explained it as a cover character, cover characters may be what things, such as a figure and a character. For example, characters, such as a character similar to an animal, clouds, the figure showing the wind, the figure showing the swirl, and the pattern displayed on pattern display area, can be considered.

[0197] Drawing 51 is explanatory drawing showing the example of the display state of the adjustable display 9 when processing which a pattern is covered by the cover character similar to the pattern displayed on pattern display area, and is substituted is performed. As shown in drawing 51 , at the time of the re-lottery after the great success display was made by the adjustable display 9, the cover character (for example, character similar to "7") similar to the predetermined pattern appears ( drawing 51 (E)), and the right figure handle in the left is covered ( drawing 51 (F)). In this cover state, substitution of a pattern is performed during right and left. After ending substitution, it considers as the state which can check the pattern after substitution by looking by making a cover character into a non-display state ( drawing 51 (G)).

[0198] As mentioned above, since it considered as the composition using the character similar to identification information (here "7") as a cover character, it becomes possible to perform game production by which the pattern was updated. Moreover, you may make it use not only a character similar to a number but a

character similar to identification information, such as an animal, as a cover character.

[0199] Moreover, since it is considered as the composition using the character similar to the identification information (this example "7") displayed when the display of a cover character is completed, production which shows the appearance display of a cover character like change of identification information can be performed.

[0200] Furthermore, since a cover character is displayed at the time of re-change and the identification information which covers a great success display, eliminates a cover character after predetermined period progress, and has a similar relation was displayed, in order to perform the upstart display of the display mode in a re-lottery etc., it becomes that it is possible to use a cover character.

[0201] Moreover, as it is shown in drawing 52 in case substitution processing of a pattern is performed for example, and may be made to substitute for the same pattern continuously, for example, is shown in drawing 53, you may be made to substitute a pattern, although especially the gestalt of each operation mentioned above did not explain so that it may be displayed in turn contrary to a predetermined array.

[0202] Moreover, although the skid production and the production using the cover character explained the example which forms a reach mode in the gestalt of each operation mentioned above, when it constitutes for example, so that the probability used as reach may serve as size when skid production is performed, and for example, a cover character appears, it is good also as composition which serves as reach by high probability further. what is necessary is making it just change the rate as which a change pattern command including specification of directing by sliding in the main substrate 31 according to the content of production is chosen about adjustment of the appearance degree of skid production, reliability, etc., for example, when it is becoming it a great success further, a reach mode and for example, the case it becoming reach when becoming the blank which does not become reach, either — It can think making high the rate as which a change pattern command including specification of performing skid production when reach production is specifically performed is chosen, and making low the rate as which a change pattern command including specification of performing skid production is chosen, when the usual production which does not become reach is performed. Thus, if constituted, a game person's expectations can be encouraged with skid production, the advent, etc. of a cover character, and the interest of a game will improve.

[0203] Moreover, it is not restricted to a pachinko game machine, but this invention can be applied also in other game machines, such as a slot machine.

[0204] Furthermore, although the pachinko game machine 1 of the gestalt of each above-mentioned operation was the 1st sort pachinko game machine with which the grant of predetermined game value to a game person is attained when the halt pattern of the special pattern by which it is indicated by adjustable at the adjustable display 9 based on starting winning a prize became the combination of a

predetermined pattern The 2nd sort pachinko game machine with which the grant of predetermined game value to a game person will be attained if winning a prize to the predetermined field of the electric accessory opened based on starting winning a prize is, When winning a prize to the predetermined electric accessory which will be opened if the halt pattern of the pattern by which it is indicated by adjustable based on starting winning a prize becomes the combination of a predetermined pattern is, even if a predetermined right is the 3rd sort pachinko game machine generated or continued this invention is applicable if the content of production is uniquely determined by the sub substrate.

[0205]

[Effect of the Invention] In invention according to claim 1, when a display-control means indicates the identification information by adjustable according to reception of the adjustable display-control signal of 1 The special control which performs the display control which substitutes the identification information displayed at the specification time defined beforehand for any or other identification information, without following in predetermined order, Since it is characterized by it being possible to choose [ which does not control specially ] any with control are usually performed, and to control the display state of adjustable display according to selection Since it becomes possible to perform processing in the case of performing the display control substituted without following identification information in predetermined order based on the same adjustable display-control signal, and processing when not performing such a display control, Production from which the number of shift within a specific period differs can be performed now based on the same adjustable display-control signal. Therefore, the number of adjustable display-control signals can be reduced.

[0206] while updating identification information in invention according to claim 2 when extraordinarily the same as control, since it is usually constituted at the specification time defined beforehand by control so that the display control which substitutes identification information for the same identification information may be performed -- predetermined order -- following -- identification information -- substitution \*\*\*\*\* -- it can be made like Therefore, it becomes possible to usually control by the same control program with control specially. Therefore, the processing burden of a display-control means is mitigated.

[0207] The special control which displays the cover character which gives an updating indication of identification information impossible [ a check by looking ] in invention according to claim 3 when a display-control means indicates the identification information by adjustable according to reception of the adjustable display-control signal of 1, The thing which do not display a cover character and for which adjustable display is usually controlled by any with control they are is possible. specially in control From the identification information currently displayed at the time of the start of a display of a cover character, to the identification information displayed at the time of the end of a display of a cover character The 1st number in

predetermined order shifts by identification information. usually in control From the identification information currently displayed at the time corresponding to the time of the start of a display of a cover character when control is chosen specially Since it is characterized by the 2nd different number from the 1st number shifting to the identification information displayed at the time corresponding to the time of the end of a display of a cover character by identification information It becomes possible to perform production using the cover character, and production which does not use a cover character based on the same adjustable display-control signal.

[0208] Since it is constituted without following in invention according to claim 4 while displaying a cover character, and following identification information in predetermined order by control specially so that the display control substituted for any or other identification information may be performed, identification information can be substituted during the display of a cover character, without following in predetermined order, and it becomes possible to perform the adjustable display which usually looks completely different from control by the same adjustable display-control signal.

[0209] Since a display-control means displays a cover character, covers a specific display mode in a re-lottery production display, eliminates a cover character after predetermined period progress in invention according to claim 5 and the specific display mode as a display result was made to display, it becomes that it is possible in increasing the kind of re-lottery production, without increasing the number of adjustable display-control signals.

[0210] In invention according to claim 6, since it considered as the composition using the character similar to the identification information displayed as a cover character at the time of the end of a display of a cover character, production which shows the appearance display of a cover character like change of identification information can be performed.

[0211] Since it consists of invention according to claim 7 so that the selection probability of whether control is performed specially or to usually perform control may change with kinds of received adjustable display-control signal and a game does not become monotonous as compared with the case where it is always fixed probability, it becomes possible to raise game nature.

[0212] In invention according to claim 8, since adjustable display is constituted so that it may have two or more adjustable viewing areas and either control or usually control may be simultaneously performed specially in two or more adjustable viewing areas of all or two or more adjustable viewing areas, it becomes possible [ performing display production in two or more adjustable viewing areas ], and becomes possible [ performing colorful production ].

[0213] In invention according to claim 9, specially, by control, since it considered as the composition which can form a reach mode, a game person can be provided with a game with unexpected nature.

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[Translation done.]

**\* NOTICES \***

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] It is the front view which saw the pachinko game machine from the transverse plane.

[Drawing 2] It is the front view which saw the game board of a pachinko game machine from the transverse plane.

[Drawing 3] It is the rear view which saw the pachinko game machine from the tooth back.

[Drawing 4] It is the block diagram showing an example of the circuitry in the main substrate.

[Drawing 5] It is the block diagram showing an example of the composition of a display-control circuit.

[Drawing 6] It is the flow chart which shows the main processing which CPU in the main substrate performs.

[Drawing 7] It is explanatory drawing showing an example of the relation of whether to perform game state restoration processing with a backup flag.

[Drawing 8] It is the flow chart which shows timer-interruption processing for 2ms.

[Drawing 9] It is explanatory drawing showing each random number.

[Drawing 10] It is explanatory drawing showing an example of a pattern during right and left.

[Drawing 11] It is the flow chart which shows pattern process processing specially.

[Drawing 12] It is the flow chart which shows the processing which judges that the hit ball won a prize of a starting winning-a-prize mouth.

[Drawing 13] It is the flow chart which shows the processing which determines the processing and the change pattern which determine the halt pattern of an adjustable display.

[Drawing 14] It is the flow chart which shows processing of a great success judging.

[Drawing 15] It is explanatory drawing showing the signal line of a display-control

command.

[Drawing 16] It is explanatory drawing showing an example of the command gestalt of control command.

[Drawing 17] It is the timing chart showing the relation of the 8-bit control signal and INT signal which constitute control command.

[Drawing 18] It is explanatory drawing showing an example of the content of a display-control command.

[Drawing 19] It is explanatory drawing showing the example of 1 composition of a command transmitting table.

[Drawing 20] It is explanatory drawing showing the example of 1 composition and other examples of composition of the command data 2.

[Drawing 21] It is explanatory drawing showing the example of 1 composition of INT data.

[Drawing 22] It is explanatory drawing showing the example of 1 composition of a command transmitting table.

[Drawing 23] It is the flow chart which shows the example of processing of display-control command control processing.

[Drawing 24] It is the flow chart which shows a command transmitting routine.

[Drawing 25] It is the flow chart which shows the main processing which CPU for display controls performs.

[Drawing 26] It is the flow chart which shows timer-interruption processing.

[Drawing 27] It is explanatory drawing showing the composition of the command receive buffer in expenditure control means.

[Drawing 28] It is the flow chart which shows command receive-interrupt processing.

[Drawing 29] It is the flow chart which shows command analysis processing.

[Drawing 30] It is explanatory drawing showing the example of the random number for skid production.

[Drawing 31] It is explanatory drawing showing the example of the random number value table for a skid production judging.

[Drawing 32] It is explanatory drawing showing the example of the activity of a change block.

[Drawing 33] It is explanatory drawing showing the example [ table / change pattern / the EXT data of a change pattern command, and ] of correspondence.

[Drawing 34] It is explanatory drawing showing the example of a change pattern table.

[Drawing 35] It is the flow chart which shows display-control process processing.

[Drawing 36] It is the flow chart which shows the waiting processing for display-control command reception of display-control process processing.

[Drawing 37] It is the flow chart which shows skid production setting processing of display-control process processing.

[Drawing 38] It is explanatory drawing showing the example in the state where the change pattern command etc. was set as the command transmitting table.

[Drawing 39] It is the flow chart which shows complete diagram handle change start processing of display-control process processing.

[Drawing 40] It is the flow chart which shows processing during pattern change of display-control process processing.

[Drawing 41] It is the flow chart which shows the waiting processing for a complete diagram handle halt of display-control process processing.

[Drawing 42] It is the flow chart which shows great success display processing of display-control process processing.

[Drawing 43] It is the timing chart which shows the example of the processing timing of adjustable display processing when not performing skid production which CPU for display controls performs.

[Drawing 44] It is explanatory drawing showing the example of the display state of an adjustable display in case skid production is not performed.

[Drawing 45] It is the timing chart which shows the example of the processing timing of adjustable display processing in the case of performing skid production which CPU for display controls performs.

[Drawing 46] It is explanatory drawing showing the example of the display state of an adjustable display in case skid production is performed.

[Drawing 47] It is the timing chart which shows other examples of the processing timing of adjustable display processing in the case of performing skid production which CPU for display controls performs.

[Drawing 48] It is explanatory drawing showing other examples of the display state of an adjustable display in case skid production is performed.

[Drawing 49] It is explanatory drawing showing other examples of the display state of an adjustable display in case skid production is performed.

[Drawing 50] It is explanatory drawing showing other examples of the display state of an adjustable display in case skid production is performed.

[Drawing 51] It is explanatory drawing showing the example of the display state of the adjustable display in the case of covering a pattern using other cover characters.

[Drawing 52] It is explanatory drawing showing the example of the display state of an adjustable display in case substitution is carried out to the same pattern.

[Drawing 53] It is explanatory drawing showing the example of the display state of an adjustable display in case substitution of a pattern is performed so that a pattern may be displayed on the opposite turn of the usual order of a list.

[Description of Notations]

1 Pachinko Game Machine

9 Adjustable Display

31 The Main Substrate

56 CPU

80 Display-Control Substrate

101 CPU for Display Controls

[Translation done.]

\* NOTICES \*

Japan Patent Office is not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 7]

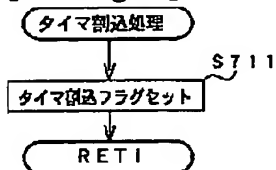
パケット チェック結果	55H	55H 以外
正常	初期化	初期化
異常	初期化	初期化

[Drawing 9]

ランダム	範囲	用途	加算
1	0~299	大当り判定用	0.002秒毎に1ずつ加算
2-1	左0~9	はずれ図柄決定用	0.002秒毎および残り処理 余り時間1ずつ加算
2-2	中0~9		ランダム2-1の値上げごとに 1ずつ加算
2-3	右0~9		ランダム2-2の値上げごとに 1ずつ加算
3	0~49	大当り図柄決定用	0.002秒毎に1ずつ加算
4	0~xx	図柄パターン決定用	0.002秒毎および残り処理 余り時間1ずつ加算

(xx=確率パターン総数-1)

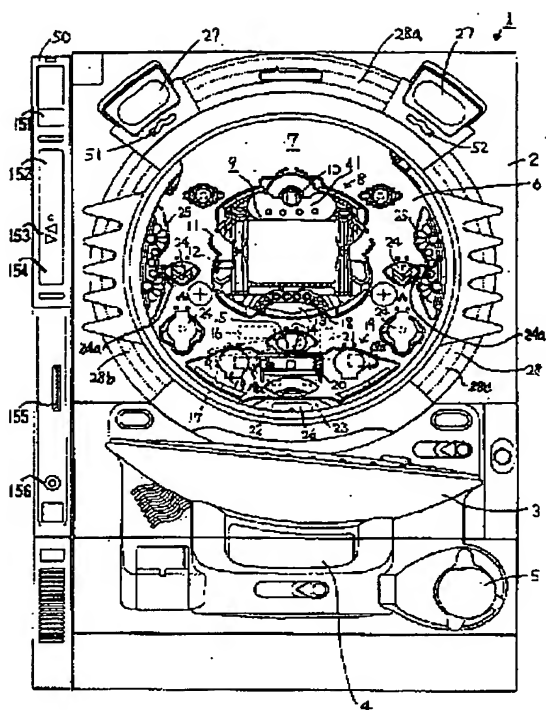
[Drawing 26]



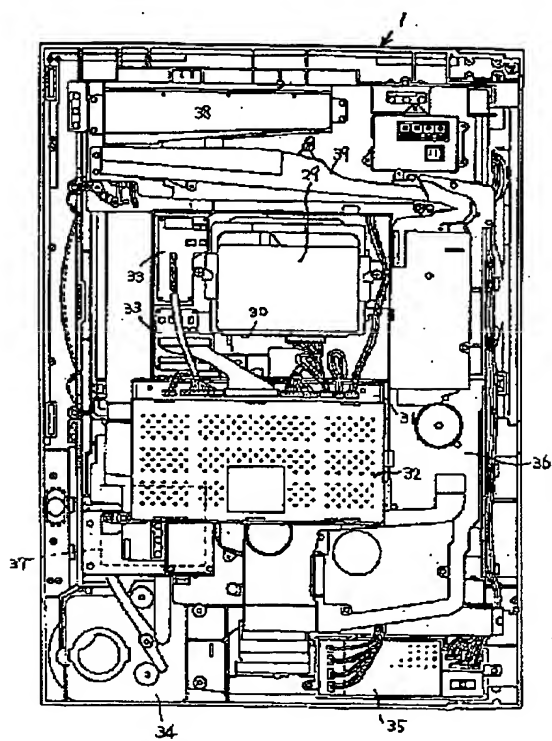
[Drawing 30]

用途	範囲
すべり演出用	0~99

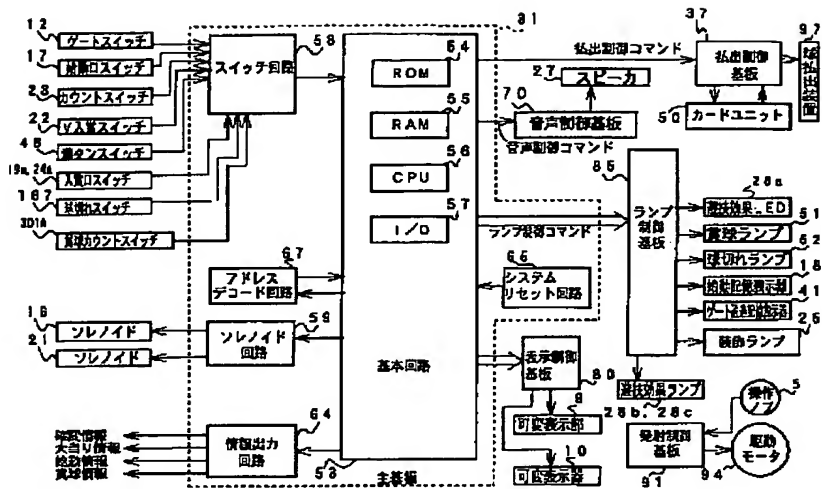
[Drawing 1]



[Drawing 2]



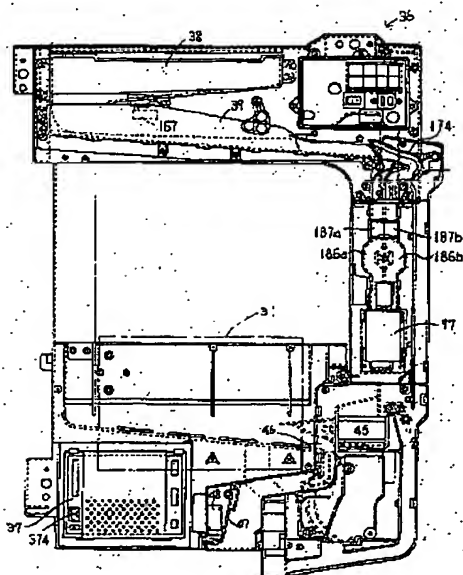
[Drawing 4]



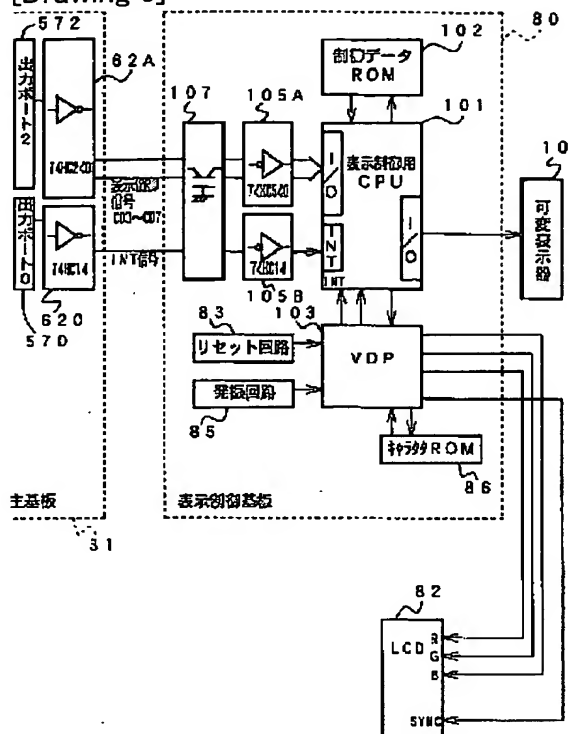
[Drawing 10]

数字表示部	数字表示部	数字表示部
0	0	0
9	9	9
8	8	8
7	7	7
6	6	6
5	5	5
4	4	4
3	3	3
2	2	2
1	1	1

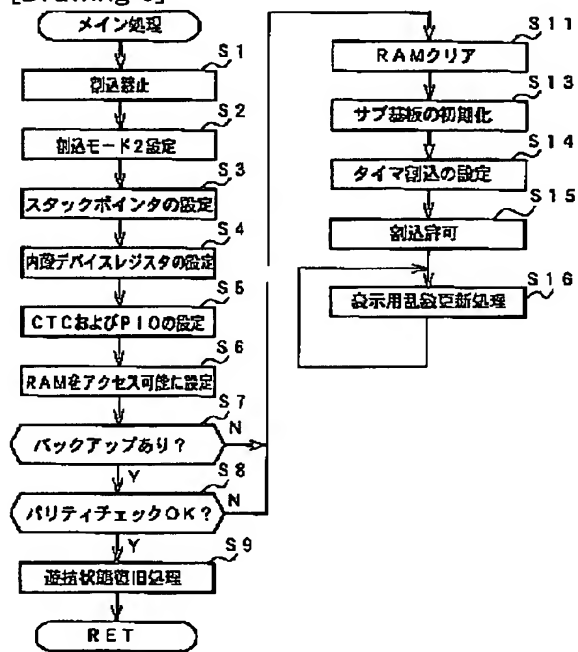
[Drawing 3]



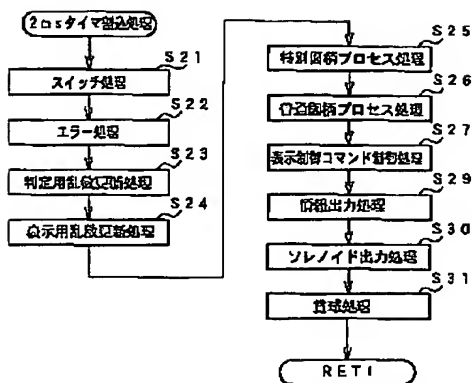
[Drawing 5]



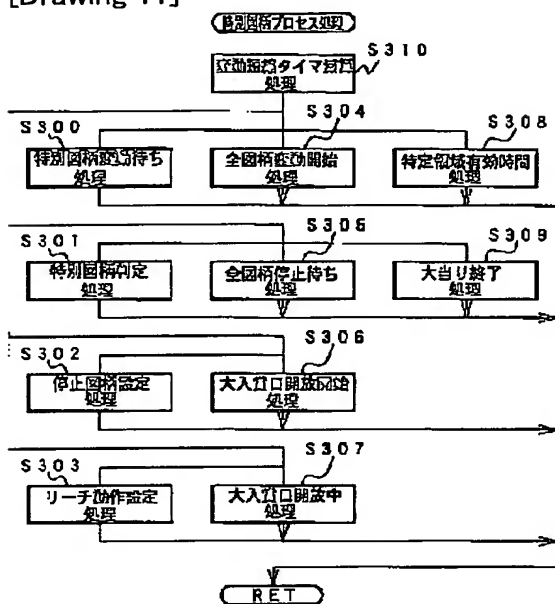
[Drawing 6]



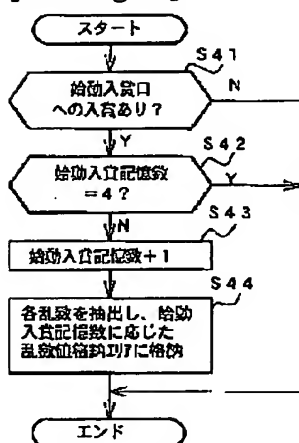
[Drawing 8]



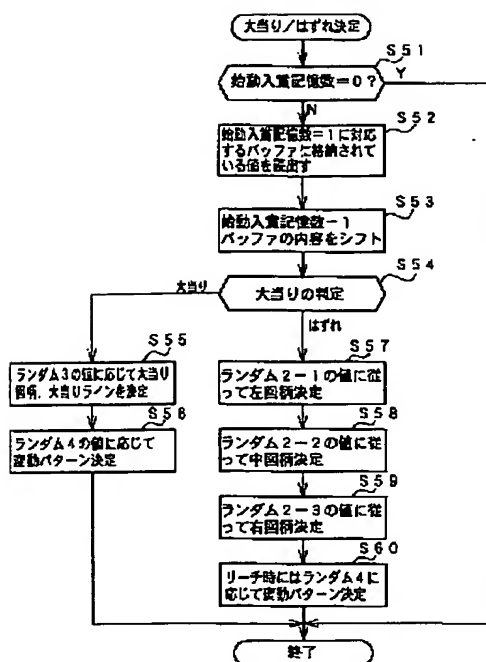
[Drawing 11]



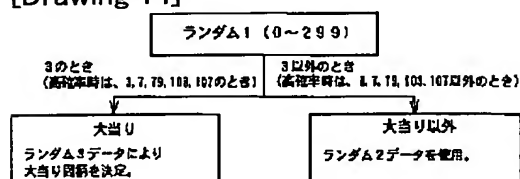
[Drawing 12]



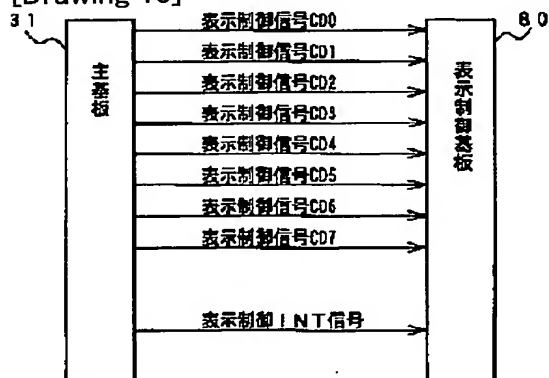
[Drawing 13]



[Drawing 14]

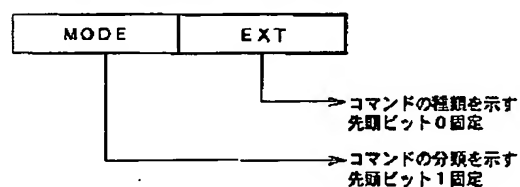


[Drawing 15]

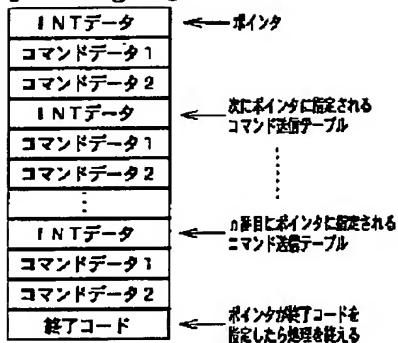


[Drawing 16]

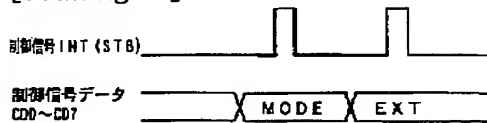
(制御コマンド：制御信号データ)



[Drawing 22]



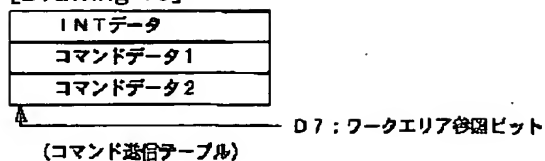
[Drawing 17]



[Drawing 18]

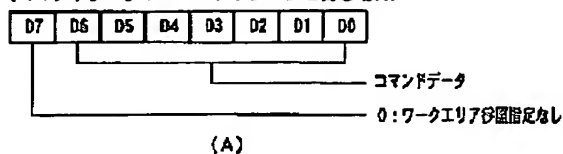
MODE	EXT	名称	内容
8 0	0 0	変動パターン指定#1	特別図柄変動パターン1の指定
8 0	X X	変動パターン指定#1~1	特別図柄変動パターン(X X-1)の指定
8 F	0 0	特別図柄電源投入時指定	特別図柄の初期化指定
8 F	0 1	普通図柄電源投入時指定	普通図柄の初期化指定
9 1	X X	左図柄指定	特別図柄左の停止図柄を指定
9 2	X X	中図柄指定	特別図柄中の停止図柄を指定
9 3	X X	右図柄指定	特別図柄右の停止図柄を指定
A 0	0 0	特別図柄停止	特別図柄の停止指示
B 1	X X	大入賞口開放時表示	X Xで示す回数目の大入賞口開放中表示指定
B 2	0 0	大当たり表示開始時	大当たり開始時画面の表示指定
B 2	X X	大入賞口開放前表示	大入賞口開放前の表示指定(X X=01以上)
B 4	0 0	大当たり図柄表示	大当たり図柄の表示指定
B 5	0 0	非特定大当たり終了表示	非特定大当たり終了時の表示指定
B 5	0 1	特定大当たり終了表示	特定大当たり終了時の表示指定
C 0	0 0	客待ちデモ表示	客待ちデモンストレーション時の表示指定
C 1	0 0	特別図柄停電復旧表示	停電復旧時の表示(特別図柄に関して)
C F	X X	テストコマンド	テストコマンド1~(X X-1)
D 0	0 0	普通図柄変動パターン1	29.2秒の変動
D 0	0 1	普通図柄変動パターン2	6.00秒の変動
D 1	0 0	普通図柄左消灯指定	普通図柄左(当り図柄)の消灯
D 1	0 1	普通図柄左点灯指定	普通図柄左(当り図柄)の点灯
D 2	0 0	普通図柄右消灯指定	普通図柄右(はずれ図柄)の消灯
D 2	0 1	普通図柄右点灯指定	普通図柄右(はずれ図柄)の点灯
D 3	0 0	普通図柄停止	普通図柄の停止指示
D 4	0 0	普通図柄停電復旧表示	停電復旧時の表示(普通図柄に関して)

[Drawing 19]

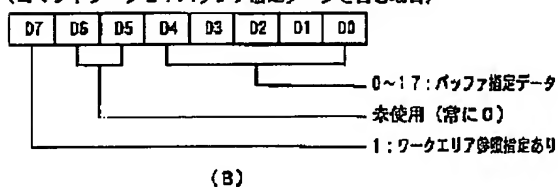


[Drawing 20]

(コマンドデータ2 : コマンドデータを含む場合)

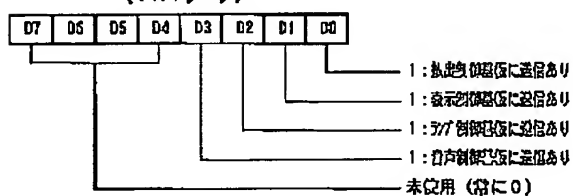


(コマンドデータ2 : バッファ指定データを含む場合)

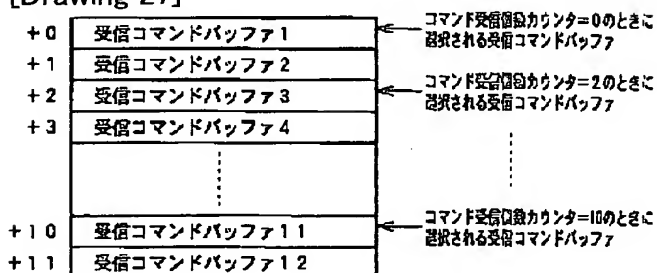


[Drawing 21]

(INTデータ)



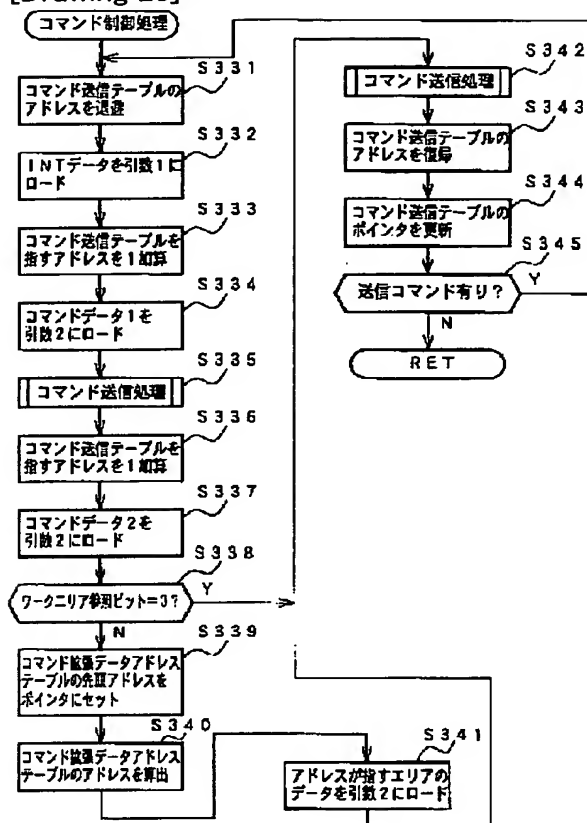
[Drawing 27]



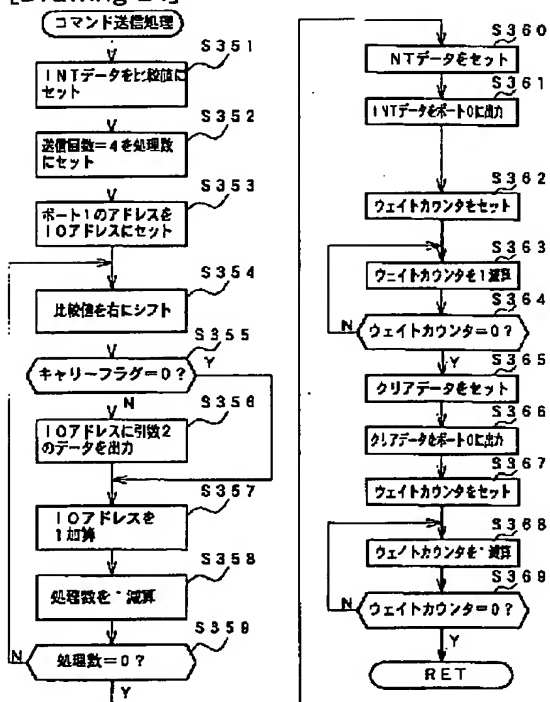
[Drawing 31]

	左右参照A すべりなし	左右参照B すべりあり
通常状態	0~98	99
左右リチはずれ、リーチFはずれ2	0~89	90~99
左右リチはずれ、リーチFはずれ1	0~79	80~99
⋮	⋮	⋮

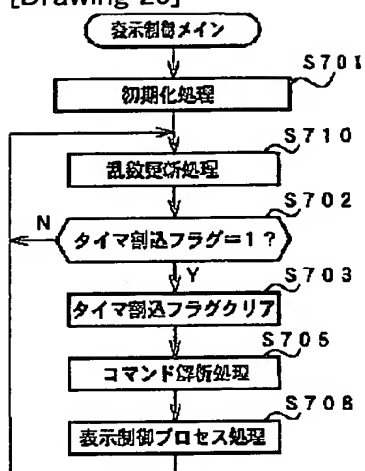
[Drawing 23]



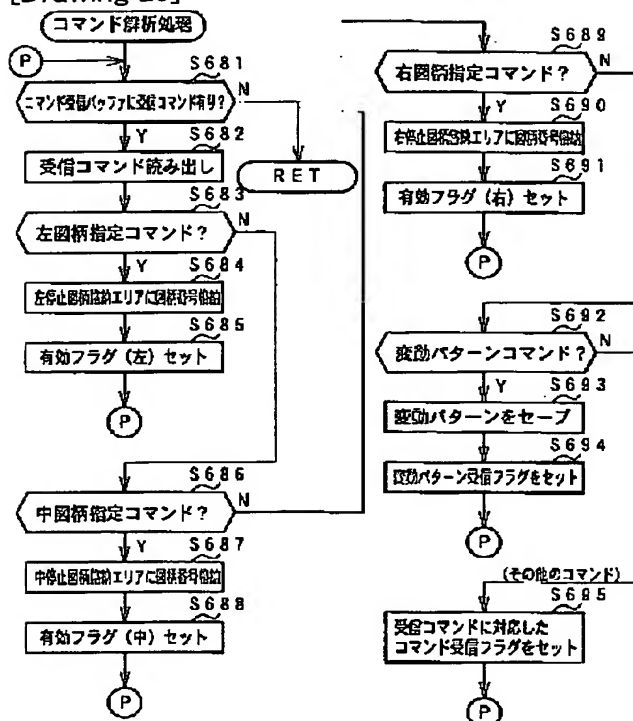
[Drawing 24]



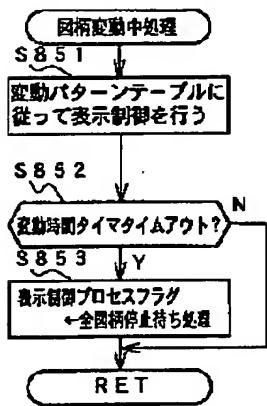
[Drawing 25]



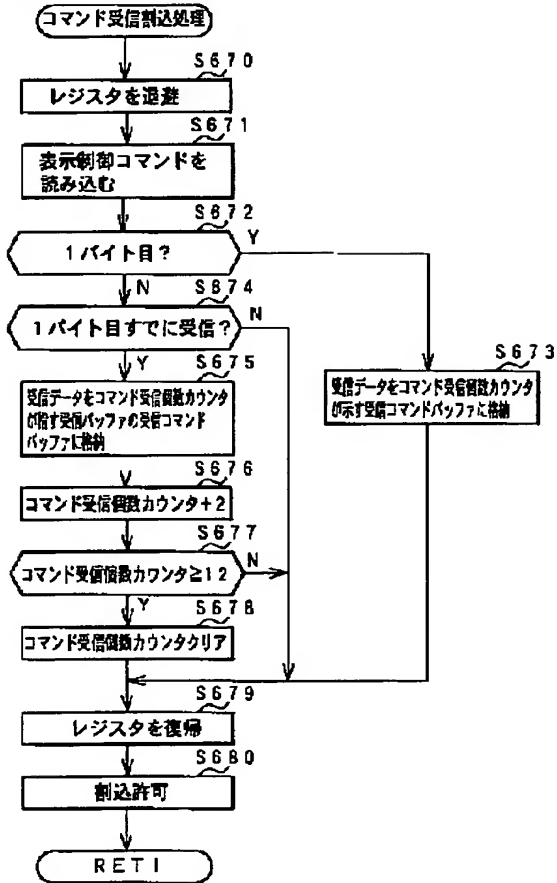
[Drawing 29]



[Drawing 40]



[Drawing 28]



[Drawing 32]

運動ブロック	動作内容
全図柄加速	通常背景
	左図柄変動開始
	中図柄変動開始
	右図柄変動開始
全図柄高速	左図柄高速変動
	中図柄高速変動
	右図柄高速変動
左右減速A (すべり無し)	左図柄を停止図柄の3図柄前に進替
	左図柄減速
	左図柄揺れ変動
	右図柄を停止図柄の3図柄前に進替
	右図柄減速
	進蔵キャラクター非表示
	右図柄差替
	進蔵キャラクター非表示
	右図柄揺れ変動
左右減速B (すべり)	左図柄を停止図柄の3図柄前に進替
	左図柄減速
	左図柄揺れ変動
	右図柄を停止図柄の1図柄前に進替
	右図柄減速
	進蔵キャラクター表示
	右図柄差替
	進蔵キャラクター非表示
	右図柄揺れ変動
中図柄減速	中図柄を停止図柄の3図柄前に進替
	中図柄減速
	中図柄揺れ変動
通常リーチ はずれ	リーチ背景
	左右図柄リーチ動作
	中図柄を停止図柄の4図柄前に進替
	中図柄減速
	中図柄揺れ変動
通常リーチ 大当り	リーチ背景
	左右図柄リーチ動作
	中図柄を停止図柄の4図柄前に進替
	中図柄減速
	中図柄揺れ変動
	大当り背景

[Drawing 33]

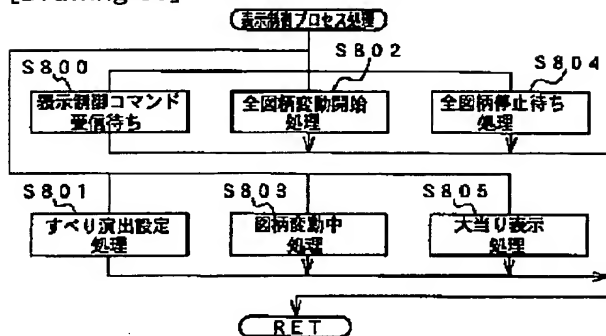
番号	EXT	表示時間	運動内容	すべり選択率
1	00H	T1	通常変動	1/100
2	01H	T2	通常リーチはずれ	10/100
3	02H	T3	通常リーチ大当り	20/100
・	・	・	・	・
20	13H	T20	リーチAはずれ1	5/100
21	14H	T21	リーチAはずれ2	50/100
22	15H	T22	リーチA大当り	70/100
・	・	・	・	・
48	2FH	T48	リーチFはずれ	20/100
49	30H	T49	リーチF大当り1	80/100
50	31H	T50	リーチF大当り2	10/100

[Drawing 34]

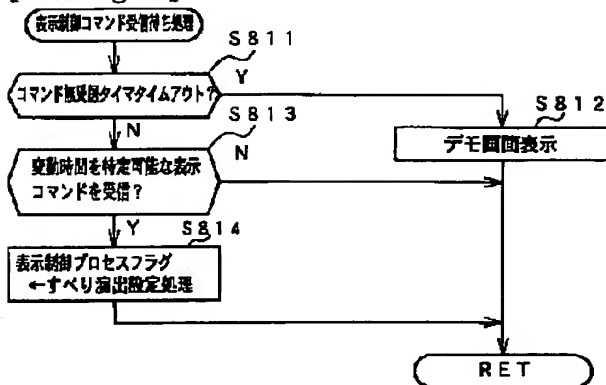
名称	EXT	変動ブロック
通常変動	00H	全図柄加速
		全図柄減速
		左右図柄減速A 左右図柄減速B
		中図柄減速
通常リーチはずれ	01H	全図柄加速
		全図柄減速
		左右図柄減速A 左右図柄減速B
		通常リーチはずれ
通常リーチ大当り	02H	全図柄加速
		全図柄減速
		左右図柄減速A 左右図柄減速B
		通常リーチ大当り
⋮	⋮	⋮

変動パターンテーブル

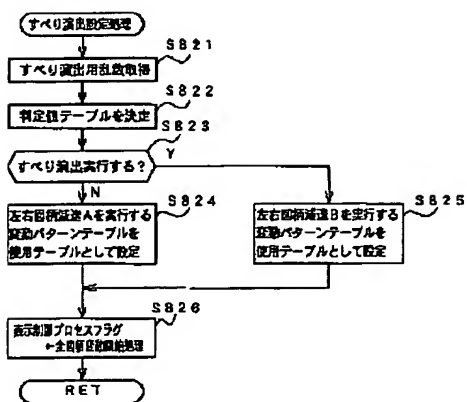
[Drawing 35]



[Drawing 36]



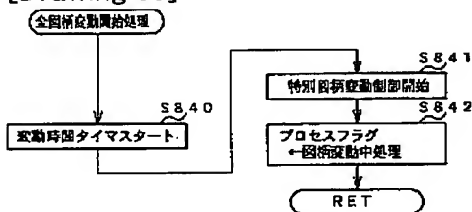
[Drawing 37]



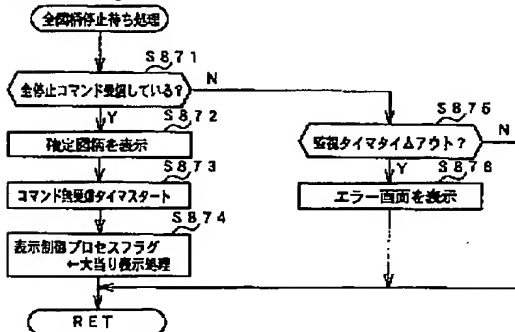
[Drawing 38]

INTデータ	表示制御番号出力INT=02 (H)	
コマンドデータ1	特別図柄変動パターンコマンド=80 (H)	(N:コマンド送信テーブル)
コマンドデータ2	ワークエリア事象発生あり+移動図柄減速パターン=88 (H)	
INTデータ	表示制御番号出力INT=02 (F)	
コマンドデータ1	特別図柄左指定コマンド=91 (F)	(H:コマンド送信テーブル)
コマンドデータ2	ワークエリア事象発生あり+移動図柄減速パターン=81 (H)	
INTデータ	表示制御番号出力INT=02 (H)	
コマンドデータ1	特別図柄中指定コマンド=92 (H)	(H:コマンド送信テーブル)
コマンドデータ2	ワークエリア事象発生あり+移動図柄減速パターン=82 (H)	
INTデータ	表示制御番号出力INT=02 (H)	
コマンドデータ1	特別図柄右指定コマンド=93 (H)	(H:コマンド送信テーブル)
コマンドデータ2	ワークエリア事象発生あり+移動図柄減速パターン=83 (H)	
終了コード	00 (H)	

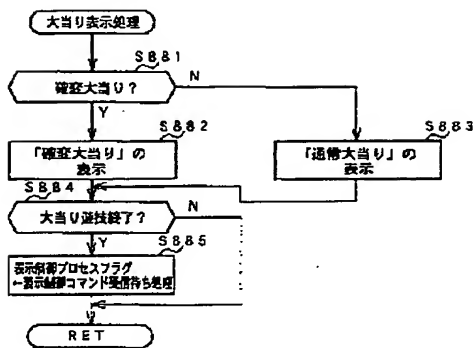
[Drawing 39]



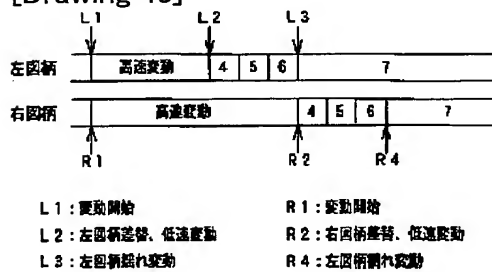
[Drawing 41]



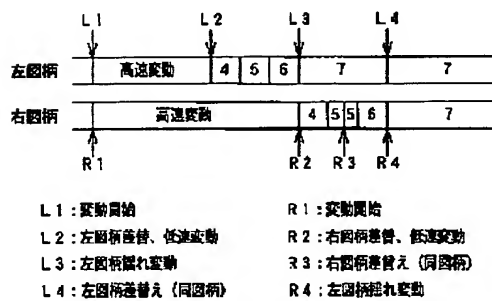
[Drawing 42]



[Drawing 43]

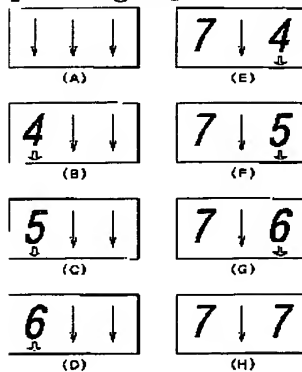


(A)

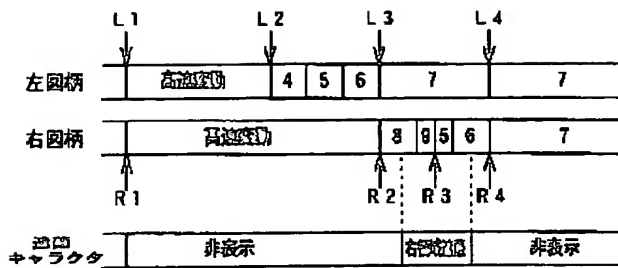


(B)

[Drawing 44]



[Drawing 45]



L 1 : 旋回開始

L 2 : 左図柄差付、低速旋回

L 3 : 左図柄遅れ旋回

L 4 : 左図柄差付入 (同図柄)

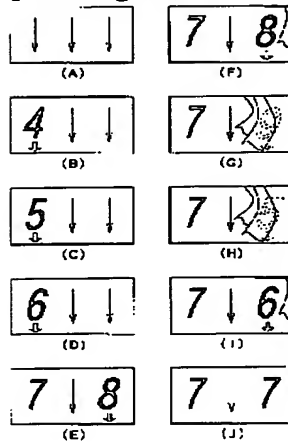
R 1 : 旋回開始

R 2 : 右図柄差付、低速旋回

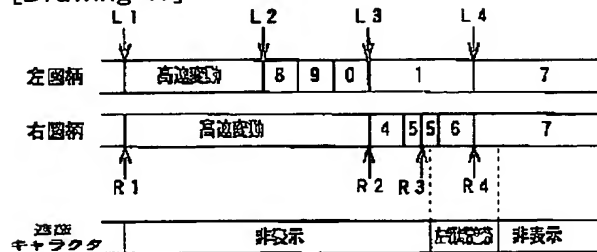
R 3 : 右図柄差付入

R 4 : 左図柄遅れ旋回

[Drawing 46]



[Drawing 47]



L 1 : 旋回開始

L 2 : 左図柄差付、低速旋回

L 3 : 左図柄遅れ旋回

L 4 : 左図柄差付入

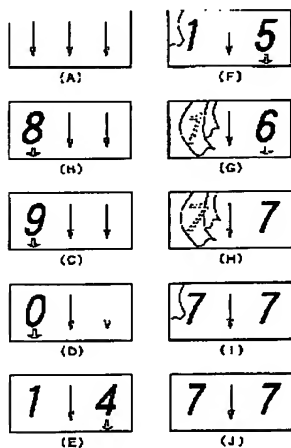
R 1 : 旋回開始

R 2 : 右図柄差付、低速旋回

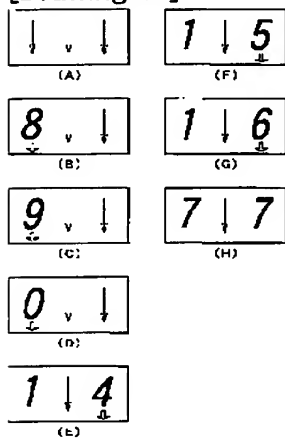
R 3 : 右図柄差付 (同図柄)

R 4 : 左図柄遅れ旋回

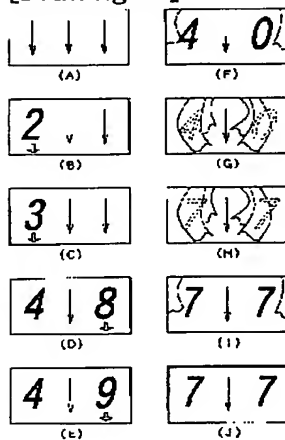
[Drawing 48]



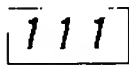
[Drawing 49]



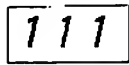
[Drawing 50]



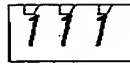
[Drawing 51]



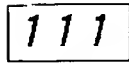
(A)



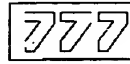
(B)



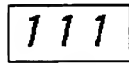
(E)



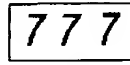
(C)



(F)

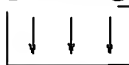


(D)

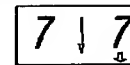


(G)

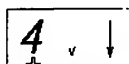
[Drawing 52]



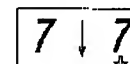
(A)



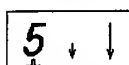
(E)



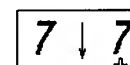
(B)



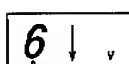
(F)



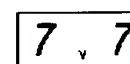
(C)



(G)



(D)

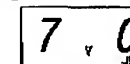


(H)

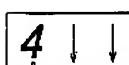
[Drawing 53]



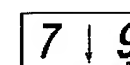
(A)



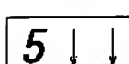
(E)



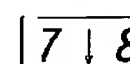
(B)



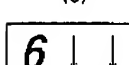
(F)



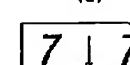
(C)



(G)



(D)



(H)

[Translation done.]